ANNUAL REPORT

Provincial Board of Health

1912

Thirty-First Annual Report

OF THE

Provincial Board of Health

OF

Ontario, Canada

FOR THE YEAR

1912

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:

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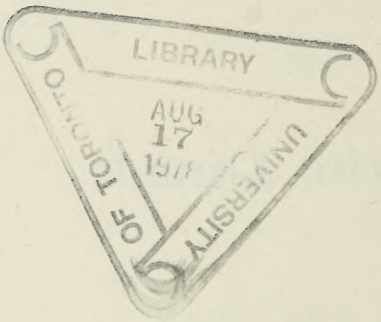

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TORONTO

To His Honour Sir John Morison Gibson, K.C., LL.D., K.C.B., etc.,

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour,—I herewith beg to present for your consideration the 31st Annual Report of the Provincial Board of Health for the year 1912.

Respectfully submitted,

W. J. Hanna,

Provincial Secretary.

To The Honourable W. J. Hanna, K.C., M.P.P.,

Provincial Secretary of Ontario.

Sir,—I have the honour to submit for your approval the Thirty-first Annual Report of the Provincial Board of Health, made in conformity with and under the provisions of the Public Health Act, for the year 1912.

I have the honour to be,

Sir,

Your obedient servant,

John W. S. McCullough,

Chief Officer of Health.

PROVINCIAL BOARD OF HEALTH OF ONTARIO

1912.

ADAM H. WRIGHT, M.D., *Chairman* ..... Toronto
HENRY R. CASGRAIN, M.D. ..... Windsor
THOMAS E. KAISER, M.D. ..... Oshawa
WILLIAM H. HOWEY, M.D. ..... Sudbury
A. A. WEAGANT, M.D. ..... Ottawa
JAMES ROBERTS, M.D., M.O.H. ..... Hamilton

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JOHN W. S. MCCULLOUGH, M.D.

Provincial Inspector,

R. W. BELL, M.D.

Provincial Bacteriologist,

J. A. AMYOT, M.D.

Branch Laboratory--Kingston,

W. T. CONNELL, M.D.

Provincial Chemist,

H. M. LANCASTER, B.A.Sc.

Provincial Sanitary Engineer,

F. A. DALLYN, B.A.Sc., C.E.

District Officers of Health,

District.

No. 1.—DAVID B. BENTLEY, M.D., Sarnia.
No. 2.—THOMAS J. MCNALLY, M.D., Guelph.
No. 3.—DANIEL A. MCCLENAHAN, M.D., Hamilton.
No. 4.—GEORGE CLINTON, M.D., Belleville.
No. 5.—PAUL J. MOLONEY, M.D., Cornwall.
No. 6.—W. EGERTON GEORGE, M.D., North Bay.
No. 7.—ROBERT E. WODEHOUSE, M.D., Fort William.

Sanitary Inspector,

GEORGE E. YOUNG.

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Resumé of the Transactions of the Board

For the Year Ending December 31st, 1912

BY THE SECRETARY

This is the Thirty-first Annual Report of the Provincial Board of Health for Ontario, being for the year ending the Thirty-first day of December, 1912.

There were four regular meetings of the Board.

The plans and specifications of water works and sewerage systems and sewage disposal plants were passed by the Board during the year as follows:

Sewers.—Almonte (extensions), Arnprior (extensions), Barrie (extensions), Berlin (extensions), Bowmanville (sewerage), Chatham (extensions), Fort William (extensions), Galt (extensions), London (Hyman Tannery sewage disposal), North Toronto (extensions), Oshawa (extensions), Peterboro (extensions), Petrolia (sewerage system), Preston (extensions), St. Catharines (extensions), Sarnia (extensions), Toronto (extensions), Waterloo (extensions), Windsor (extensions).

Water Works.—Alliston (system), Berlin (extension), Bourget (system), Brampton (system), Brighton (system), Burk's Falls (water filtration), Clinton (system), Collingwood (intake pipe), Cornwall (extension), Dunnville (water by-law), Fergus (water by-law), Haileybury (water filtration), Hanover (extension), Leamington (extension), Oakville (extension), Ottawa (filtration), Parkhill (system), Pembroke (extension), Port Colborne (extension), Port Stanley (system), Ridgetown (system), St. Catharines (extension), Sarnia (system and filtration), Vankleek Hill (system), Weston (extension), Wingham (extension).

During the early portion of the year the Secretary, in company with the City Engineer of Ottawa, Mr. N. J. Ker, visited and examined the water purification plants at Washington, D.C., Philadelphia, Pa., Columbus and Cincinnati, O., Louisville, Ky., and New Orleans, La. Every facility was afforded us by the officials at each of these places of observing the process in use and the results obtained, and our thanks are due and hereby tendered to the courteous gentlemen in charge of the various plants.

In the month of January, 1912, an investigation was held by me into the causes of the outbreak of typhoid fever in Sarnia. A large number of witnesses were examined, and the evidence of these witnesses and the conclusions arrived at are embodied in a special report published by the Board.

In the early summer an outbreak of typhoid fever in the City of Ottawa reached large proportions. The causes were similar to those of the epidemic referred to in the last report of the Board. Public opinion in Ottawa became so aroused that an investigation was held into its causes by the County Judge. His report contained some severe strictures upon various city officials, including the Medical Officer of Health and City Engineer, both of whom resigned in consequence. The results of these two investigations quite sustain the position of the Board in attributing the causes in both cases to polluted water, and already have had the effect of steps being taken to procure adequate and satisfactory supplies in both instances.

The complete revision of the Public Health Act and of the Vaccination Act by the Legislature of 1912 marks a new era in sanitary work in the Province. Under the former Act provision was made for ten District Officers of Health. Of this number, seven have been appointed. They were given a course of instruction by the Board and the University of Toronto, and began their duties near the close of the year; so that, including the Provincial Medical Inspector and Provincial Sanitary Inspector, upon whom all the work of sanitary supervision of a Province comprising 407,262 square miles (an area three and one-half times the size of Great Britain) formerly devolved we have now nine officers for this work. The number is not at all adequate, but it is a good beginning, and the Board feels confident, judging from the character of the men appointed that the results they will accomplish will afford good grounds for adding to their number before many years elapse.

The Districts with their respective officers are as follows:

District No. 1.—Comprising Counties of Elgin, Essex, Lambton, Middlesex, Kent and Oxford: Dr. D. B. Bentley, Sarnia.

Dictrict No. 2.—Comprising Counties of Bruce, Dufferin, Grey, Huron, Perth, Wellington, and Waterloo: Dr. T. J. McNally, Guelph.

District No. 3.—Comprising Counties of Brant, Haldimand, Halton, Lincoln, Norfolk, Peel, Welland, Wentworth, and York: Dr. D. A. McClenahan, Hamilton.

District. No. 4.—Comprising Counties of Ontario, Durham, Northumberland, Prince Edward, Hastings, Peterborough, Victoria, Haliburton, Muskoka, and Simcoe: Dr. George Clinton, Belleville.

District No. 5.—Comprising Counties of Lennox and Addington, Frontenac, Leeds, Grenville, Stormont, Dundas, Glengarry, Prescott, Russell, Carleton, Lanark and Renfrew: Dr. P. J. Moloney, Cornwall.

District No. 6.—Comprising the districts of Parry Sound, Nipissing, Temiskaming, and Sudbury: Dr. W. E. George, North Bay.

District No. 7.—Comprising districts of Algoma, Manitoulin, Rainy River, Kenora, and Thunder Bay: Dr. R. E. Wodehouse, Fort William.

Another satisfactory feature of the recent legislation is the permanency given to the office of the local Medical Officer of Health. It had become the rule, especially in the smaller towns, villages and townships, to change the Medical Officer of Health annually. This fact, together with the additional one that this officer usually received but a trifling remuneration for his services, had the effect of making the Medical Officer of Health a mere figurehead. He had no incentive to improve his sanitary knowledge or utilize that which he possessed. Now the law requires that he shall be paid a reasonable salary and he cannot be dismissed except for cause and with the consent of the Provincial Board. In addition, the Medical Officer of Health becomes a member of the local Board of Health and its executive officer. He is required to attend an annual conference of the Health Officers of the Province, for which the local municipality pays his expenses. The members of the Local Boards of Health have been reduced in numbers. Places of 4,000 and upwards have five members, and those under 4,000 population, three members. The Chief Officer of Health is the executive officer of the Provincial Board, and between meetings of the Board, of which four are required to be held each year, he possesses all the powers of the Board.

The District Officers give their whole time to the work of public health.

The new legislation places the control of isolation hospitals under the Local Boards of Health, and provision is made for arbitration similar to that under the Sanatorium Act where disputes arise respecting the establishment of such an institution outside the municipality.

The Act makes provision for the medical care of indigents, requiring that this duty shall not, as in the past, be saddled upon the medical practitioners of the community without remuneration.

Perhaps the most important features of the revised Health Act are the provisions respecting public water supplies and disposal of sewage. In the case of water supplies, the source of supply and proposed works must be approved by the Provincial Board. In the case of sewers or sewage disposal works the same approval is necessary, and, in case the Board signifies that works of either kind are necessary, no vote of the people is needed to raise money for either of these purposes. Further, if the Board reports that in the interest of public health a water works system, water purification plant, a sewerage system or a sewage disposal plant is necessary, the municipality is obliged to forthwith establish them. This will probably prevent the former laxity of municipalities, the waste of money incurred in the establishment of incomplete works, and in taking a vote of the people upon questions which they obviously could not intelligently pass upon.

The provisions of the Act in respect to the care of employees in lumber, mining and construction camps in unorganized districts are included in the Act.

The statutory by-law (Section 114), known as Schedule B, has been revised and may be amended or altered by a municipality to meet any special requirements, with the consent of the Provincial Board.

In conformity with the Act, new Regulations have been passed by the Board and confirmed by Order-in-Council in respect to various matters such as communicable diseases, burials and disinterment, meat inspection, etc., all of which are included in this report. An important addition are the regulations respecting tuberculosis, requiring for the first time that this disease be made notifiable.

The Vaccination Act was revised to provide that where smallpox exists in a municipality, or where its proximity leads the Provincial or Local Board to anticipate danger of an outbreak, the Council must order compulsory vaccination (Section 12); and under similar circumstances the Medical Officer of Health, with the approval of the Local Board, may require certificates of vaccination from all pupils or students attending schools.

As an indication of public opinion in respect to these Acts, the following from the London "Lancet" of June 1st, may be quoted:

THE PUBLIC HEALTH ACT.

"The first of these is a codified and amended Public Health Act, which contains many provisions that are found in English legislation, as well as others which break new ground. The 'communicable diseases' of the Act, for example, all of which are required to be notified to the Medical Officer of Health or local Board of Health, and to be controlled by regulations of the central authority, include tuberculosis (apparently in all forms), mumps, measles, anthrax, rabies, poliomyelitis and cerebro-spinal fever, as well as those which are specified in our Infectious Diseases (Notification) Acts. In addition to powers given to municipalities to make hospital and sanatorium provision for communicable diseases, the Act empowers the erection of emergency hospitals, which may be provided by taking any suitable land or any unoccupied building without prior agreement with the

owner, subject to a subsequent adjustment of compensation. One municipality is given the right to recover from another all cost of dealing with an epidemic which has been introduced into the former district through neglect of the medical officer of health, local board, or corporation of the latter. 'Nuisances,' again have a wide definition, and include such conditions as overcrowded houses, furnaces which do not consume their own smoke, and any premises (whether inhabited or not) which are in a dangerous condition. The medical treatment of persons in a state of poverty is included in the duties of the local public health authority, and contracts for such treatment, providing 'fair and reasonable remuneration for services rendered,' have to be made by municipalities with the medical officer of health or with local medical practitioners. Other parts of the Act deal with local water supplies and sewerage systems, and if properly administered should be of the greatest value for the prevention of water-borne infection. Public abattoirs are authorized, though no powers seems to be conferred on local authorities to require them to be used or to abolish private slaughtering establishments.

"It may be concluded from the Act that the Canadian Legislature does not share the traditional English objection to giving administrative authority to the expert. The local board of health established in every city is to appoint a medical officer of health as its executive officer; he is given security of tenure and is himself a member of the local board. A meeting of all medical officers of health in the province is to be annually convened by the central authority, the Provincial Board of Health. This body appears to combine functions which are exercised in this country both by the Local Government Board and County Councils. At least four out of the six members are legally qualified medical practitioners, and the chief officer of health, who is ex-officio a member of the board, acts as its secretary and is its principal executive officer. Ten district officers of health act under the Board's instructions in supervisory and administrative work throughout the province. This central health officer has been given wide powers to make regulations and to act in place of local authorities, and it would seem to hold in its hand the whole sanitary future of the great area under its charge."

Vaccination Act.

"The Vaccination Act of the Province of Ontario, also passed this year, requires infants to be vaccinated within three months, and a fine is imposed for non-compliance in the absence of sufficient reason, such as ill health or insusceptibility. A municipality may by proclamation require vaccination or revaccination of all residents who have not been vaccinated within seven years, and when smallpox is prevalent or is threatened the medical officer of health may exclude from any school or college a pupil who does not produce a certificate of successful vaccination, revaccination, or insusceptibility. The Provincial Government arranges for vaccination through hospitals and dispensaries which receive grants from public funds. Such institutions are required to arrange for the attendance of a public vaccinator on stated days, and to undertake the supply of vaccine lymph to medical practitioners who require it. Domiciliary vaccination in Ontario is thus vaccination by private practitioners with lymph supplied at the public expense. Every municipality, however, is to appoint a public vaccinator to vaccinate at the public cost all poor persons who come to him for the purpose, and all other persons at their own expense. In the matter of vaccination the Ontario legislature has done well to depart widely from the English model. The new Act does not provide special means of exemp-

tion to the 'conscientious objector,' or invite each individual to avoid taking his share in the action which the State desires for the common good."

The Public Health Exhibit and motion pictures travelled over a great extent of the Province during the winter months, being shown as far east as Kingston and west as far as Kenora. These features were continued at the Canadian National Exhibition, and from the numbers in attendance seem to have created a great deal of interest. Large quantities of literature, including not only information respecting communicable diseases but also "The Care of the Baby," "Sewage Disposal for Residences," "Flies," and "Mosquitoes" were distributed during the year.

The first Annual Conference of Health Officers held in accordance with the Act took place in September in conjunction with the meeting of the Canadian Public Health Association. There was a large attendance of the Medical Officers of Health from all over the province and much useful and practical information was gained.

During the year the Board made arrangements to distribute to each Medical Officer of Health a set of outfits for the collection of sputum, diphtheria exudate and blood specimens. These are kept on hand by the Medical Officer of Health and supplied on demand to the various local physicians.

Work at the Experimental Laboratory continued throughout the year and a preliminary report by the Engineer is included herein.

Our general laboratory has done a heavy year's work, not only in the examination of the various specimens sent by physicians, but also in examination of public and private water supplies and in the preventive treatment of rabies cases. Detailed reports of all this work will be found in this volume.

The officers of the Board have had several conferences with the members of the International Joint Commission respecting the examination of the International Waterways, with the object of determining the character and extent of the pollution of these waters, and, with a view to facilitating this important work, the Board, through the writer, offered to supply and pay the men for the technical work, providing the Joint Commission would pay the expenses. This was agreed to, and at the time of writing the work is in progress.

The reports of the Provincial Medical Inspector and of the Branch Laboratory at Kingston are included herewith.

CASES AND DEATHS FROM COMMUNICABLE DISEASES REPORTED WEEKLY BY LOCAL BOARDS OF HEALTH FOR THE YEAR 1912.

Month.	Smallpox.		Scarlet Fever		Diphtheria.		Measles.		Whooping Cough.		Typhoid.		Tuberculosis		Infantile Paralysis.		Cerebro-spinal Meningitis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
January	38	.....	285	10	248	38	89	2	110	5	41	12	117	55	1	.....	5	4
February	73	.....	193	15	182	23	111	12	44	7	36	15	92	58	2	1	3	3
March	106	2	298	16	238	22	300	4	183	12	87	10	154	84	.....	.....	2	2
April	103	.....	238	16	156	15	579	3	110	9	34	14	117	78	2	2	12	12
May	52	1	297	8	169	28	588	15	94	18	35	13	100	58	.....	.....	4	4
June	16	.....	207	4	160	10	287	7	193	17	39	9	123	55	.....	.....	5	5
July	23	.....	230	5	123	9	106	3	42	9	550	15	92	56	.....	.....	7	7
August	31	.....	140	10	193	27	64	3	348	30	1,022	94	179	119	15	8	13	13
September	4	.....	97	6	118	14	80	3	109	16	299	31	111	60	12	6	4	4
October	5	.....	144	1	200	22	126	1	34	4	173	36	101	67	13	1	2	2
November	33	.....	165	12	237	13	91	1	44	2	142	27	148	80	3	.....	1	1
December	51	.....	252	8	316	17	213	4	103	13	111	29	191	90	1	1	1	1
	535	3	2,646	111	2,340	238	2,634	58	1,414	142	2,569	305	1,525	*860	49	19	59	58

* Only 36 per cent. of these deaths are reported weekly by Local Boards of Health. See correct number in Tuberculosis table by ages.

DEATHS IN ONTARIO FROM TUBERCULOSIS BY AGES FOR 10 YEARS, 1902-1911.

Year.	Total.	Under 5 years.					5-9	10-14	15-19	20-29	30-39	40-49	50-59	60-69	70-79	80 and over	Not given.	Total deaths from all causes.
		0-1	1	2	3	4												
1902	2,694	102	35	28	11	6	45	75	236	742	562	366	226	161	64	12	23	27,864
1903	2,723	140	66	31	16	14	55	78	255	773	508	323	209	167	51	13	24	29,664
1904	2,877	7	52	26	9	17	52	78	278	826	587	374	257	175	104	13	22	31,290
1905	2,667	.....	55	31	21	18	47	85	266	813	509	341	212	144	79	16	30	31,371
1906	2,911	251	72	23	14	14	38	74	234	724	604	367	228	169	66	19	14	32,782
1907	2,530	74	41	27	20	15	44	62	206	745	499	311	227	173	64	9	13	33,502
1908	2,511	68	46	20	13	13	43	67	216	764	479	315	217	136	70	14	30	32,714
1909	2,380	47	27	25	9	15	54	54	179	687	487	290	222	163	66	15	40	32,628
1910	2,291	38	35	19	15	6	36	55	184	652	463	293	222	160	71	18	24	33,539
1911	2,353	63	30	15	10	18	48	64	181	618	476	325	218	156	85	12	34	34,341
	25,937	790	459	245	138	136	462	692	2,235	7,344	5,174	3,305	2,238	1,604	720	141	254	319,695

Reports of Medical Inspector R. W. Bell, M.D.

REPORT *RE* PROPOSED PARK POND AT BARRIE.

To the Secretary of the Provincial Board of Health.

SIR,—As instructed by you, I visited Barrie on the 19th inst. to report upon a proposed artificial pond in a park. With Dr. Little, M.O.H., Mr. Vickers, Chairman of Park Commission, and Messrs. McLaren and Hamley, I examined the location and source of water supply for it.

The pond is in a small natural hollow in the south-eastern corner of the park, and only 40 or 50 feet across with springy ground around it, nice clear water issuing from one spring. It has already a concrete dam on its lower side and is to be stoned up on the other sides. Into it, however, runs an open drain from the east side of the park, and this continues eastward several blocks along Sophia Street, receiving all the spring freshet and surface drainage after rain storms, also drainage from many private properties adjoining, and without doubt a certain amount of house drainage, if not from closets. This certainly has been the case in the past if not at the time of my visit. The pond at the present time is filled with this dirty drainage and, if continued, must constitute a nuisance and should not be permitted.

If the drain is diverted to a town sewer or elsewhere and the pond fed from the springs or civic water supply, it would be sanitary and add to the beauty of the park. This I advised, and suggested having the town engineer make the necessary plans, and the suggestion seemingly met with the approval of the local authorities who were with me.

R. W. BELL,
Provincial Inspector of Health.

July 23rd, 1912.

REPORT *RE* POLLUTION OF WATER AT LONGFORD.

To the Secretary Provincial Board of Health.

SIR,—I visited Longford on the 19th inst *re* pollution of Lake St. John from the Standard Chemical Co. Works. Here immense quantities of hardwood are used for the manufacture of wood alcohol, charcoal, acetone, etc., the buildings being situated on the shore of the lake. I found a half-dozen rivulets from one to two feet wide running down to the lake. These were apparently only hot water from the condensers, excepting one which was colored a greenish yellow, and on reaching the lake an oily scum spread over the water. This I was informed by Mr. Windrum, manager of the works, was of a creosote character and was the only waste passing into the water, and only as the result of the flushing out of the condensers by the hose once a day. The water of the lake is but little used.

In the immediate neighborhood drinking water is obtained from wells, but lake water is used for all other purposes. Under the circumstances the pollution should be stopped, and there should be no difficulty in providing for it otherwise.

R. W. Bell,

Provincial Inspector of Health.

July 22nd, 1912.

To the Secretary of the Provincial Board of Health, Ontario.

Sir,—I have the honour to report in respect to the premises at 814 Shaw Street, in the City of Toronto, which I visited on the 25th inst. in company with Inspector Scholes of the City.

I found preparations being made for building upon this site, the cellar being excavated to depth of 5 or 6 feet, and for foundations to depth of 15 to 20 feet. The whole site is upon a dump from which there was at the time of my visit a most disgusting odor.

The site is in my opinion totally unfit from a sanitary point of view for building purposes. I do not consider that any form of concrete wall or floor will make it satisfactory for such purpose.

All of which is respectfully submitted.

R. W. Bell,

Provincial Inspector of Health.

Toronto, July 31st, 1912.

REPORT *RE* DRAIN AT KINMOUNT.

To the Secretary of the Provincial Board of Health.

Sir,—As instructed by you, I visited Kinmount, in Township of Somerville, on Monday, 22nd inst., *re* unsanitary conditions caused by a drain. I went there with Reeve Morrison, Clerk Suddaby, Mr. Hopkins, of the Board of Health, and Mr. Train, looked over the situation and found as follows: The Burnt River runs through the village in a southerly direction, and about 100 yards west of it is the line of the G. T. R. Between these lies the business part of the village on low flat filled-in ground. During spring freshets much of this section is liable to be flooded, the trouble being added to by a mill dam about 100 yards down stream holding the water back in a small pond adjoining the main street. A permit I am told was given by the Dominion authorities for the erection of this dam to the height of about 7 feet 6 inches in or about 1886. It has been added to since until now about 10 or 12 feet, holding the level of the water so high that proper drainage to the stream is almost impossible. The drain complained of, which empties into the pond, was satisfactory at one time when the dam was lower and the level of water in mill pond consequently lower. It originates in a small marsh about 100 x 50 feet, west of the railway track under which it passes, thence alongside the railway em-

bankment and under a shed into Mr. Hopkins' yard, being there covered for a driveway, thence under the street to the pond. The sections of drain under the railway track and under the street were at one time deep enough, but the railway put in new ones, not apparently low enough to drain off the water, and as a result the flow is obstructed by much filling of sand, etc., also by much rubbish in the open section, a board wall of a shed, and by flags, stocks, and roots in the marsh, all these causing stagnant water and an unsanitary condition in the yards and cellars in the immediate vicinity.

The remedy: The drain must be cleared of all obstructions, including the lowering of the culverts under the railway track and street to a proper grade, and kept clear; the marsh should be filled in, leaving a drain across it for the flow from a spring which is the source of the water supply.

All this can be readily done and will go a long way to relieve the trouble, as Mr. George Smith, C.E., who investigated the location last November, reports a fall of 3 feet 7 inches from the upper end of the marsh to the pond, a distance of about 100 yards.

In order, however, to entirely remedy the trouble, it may be necessary to lower the dam. I would also suggest the carrying of the outlet of the drain below the dam, either along the west side of the pond, or by a pipe under its water and through the dam.

I may add that Kinmount is a police village, and there is evidently considerable reluctance on the part of the Township Board of Health to spend municipal funds to relieve what is looked on as a purely local trouble.

All of which is respectfully submitted.

R. W. Bell,
Provincial Inspector of Health.

Toronto, April 24th, 1912.

REPORT *RE* RENDERING WORKS, GUELPH.

To the Secretary, Provincial Board of Health.

Sir,—As instructed by you, I visited Guelph on the 4th inst., *re* a Rendering Plant situated in the city close to the junction station, and which it is proposed to remove to the neighborhood of the sewage disposal works, outside the city in Guelph Township, because of complaints of residents nearby within one hundred yards, who say that the odors therefrom are a nuisance.

The Board of Health of the Township object to such removal into their municipality.

In company with Mayor Thorp and Dr. Howitt, M.O.H., of the city, Mr. Laidlaw, and Dr. Roberts, M.O.H., of the township, and several other officials, I looked over both localities. I was assured by several city officials that there should be no objections on the ground of the works being a nuisance, as the odors did not last more than half an hour after the opening of the tank. This was hardly consistent with the reasons given for the desire to move.

However, I may say at the time of my visit there were in the tank carcasses of a horse, dogs, and other animals, and the tank was ready for opening. Prior to opening, there was a most disagreeable odor about the premises, and after opening

I certainly had no desire to stay for a half hour to learn personally if all would disappear at that time, as only on the windward side could one escape from the most disgusting and sickening effluvia.

At the sewage disposal location the relief would only be to the present sufferers, and the nuisance would be transferred to others who, although rather more distant —say 300 or 400 yards—would, without doubt, if the wind was in their direction, get the full benefit of this horrible stench.

The expressed intention of the owner is to considerably enlarge the plant if moved. While it is without doubt a convenience to the community in getting rid of dead animals, and a source of profit to the owner, I have no hesitation in pronouncing the plant, as now conducted, a nuisance, and upholding the township authorities in their objection to its removal to the proposed location in their municipality.

At a later conference with all parties, I suggested each sending a representative to visit similar plants in two or three other cities to find out conditions there, and possibly learn of some feasible means of lessening the nuisance and thereby enabling them to come to some mutual agreement regarding it.

R. W. Bell,

Provincial Inspector of Health.

Toronto, June 6th, 1912.

REPORT *RE* RENDERING WORKS AT GUELPH.

To the Secretary, Provincial Board of Health.

Sir,—As instructed by you, I visited the Rendering Plant at Guelph on 30th September ult., to find out if it is proving a nuisance. I was accompanied by Major Merewether, Sanitary Inspector, and while there Dr. Howitt, M.O.H., also visited the premises. It may be recalled that I inspected this same plant on July 4th last, when it was owned by Mr. Rolland, since deceased. It was then contemplated to have it moved outside the city, but so far no move has been made.

The carcass of a horse was in the tank at the time of my recent visit. The sickening odor was quite perceptible fully 200 yards before I reached the premises, and in its neighborhood on the lee side was unbearable. The surrounding yard, which had been in a foul condition, was much improved and comparatively clean.

I can now, however, only reiterate all said in my previous report and pronounce the plant a nuisance to most of the residents for a considerable area surrounding it. The owner of an abattoir adjoining this plant is anxious to purchase, enlarge, and continue it, but this I do not think should be permitted in its present situation.

R. W. Bell,

Provincial Inspector of Health.

October 3rd, 1912.

REPORT *RE* PIGGERY AT TARA.

To the Secretary of the Provincial Board of Health, Ontario.

SIR,—Complaints having been made about a piggery at Tara being a nuisance, I, as directed by you, visited that place on the 20th inst. to investigate the correctness of the complaint. On my arrival at the railway station there late the previous evening my nostrils at once made me aware of some disgusting nuisance in the near neighborhood. The following morning, with Dr. Armstrong, M.O.H. of the Township of Arran, I visited the location and found a piggery about 150 yards from the railway station, situated in the township above named. About 40 yards from it and within the village limits of Tara is a Butter Factory which turns out about a ton of butter per day.

Between the factory and piggery runs a small stream, the Sable River, and across it is pumped the buttermilk which is fed to the hogs. The hog pen is a frame building 100 feet long, divided into 20 compartments, in each of which were from 12 to 14 hogs, in all about 260. As no bedding is used for the hogs, it may be realized that the place is far from clean, although at the time of my visit I found a man busy sweeping the pens, the contents going into troughs running alongside and thence into cement tanks from which it is pumped once or twice weekly and spread on adjoining fields. The odor must be horrible for those towards whom the wind carries it. I do not see how it is possible to prevent the butter being tainted when the surrounding atmosphere is saturated with the disgusting stench. The factory and piggery are owned by the same persons, and they have been notified by the township Board of Health months ago to abate the nuisance, which I have no hesitation in pronouncing as such.

R. W. BELL,
Provincial Inspector of Health.

June 22nd, 1912.

REPORT *RE* UNSANITARY CONDITIONS, ST. MARY'S.

To the Secretary, Provincial Board of Health, Ontario.

SIR,—A special request having come from the M.O.H. of St. Mary's for a Provincial Officer to investigate several unsanitary nuisances existing in that town, I undertook the task with him on Wednesday, the 3rd inst. We visited the premises of twenty-three business people, viz., hotels, groceries, confectioneries, bakeries, fruit dealers, butcher shops, etc.

The principal complaints were in regard to the disposal of garbage, decaying fruits, and vegetables, and I must say that the complaints were quite justified in most cases. There is evidently great carelessness and indifference as to the protection of fruits, bread, pastry, and confectionery, etc., from flies breeding in manure and garbage, and from street dust. But little screening of foods was seen, and the conditions under which some baking was done were far from sanitary.

The hotel yards were as a rule clean and satisfactory, excepting the garbage barrels were not covered. In all cases the offending parties were advised with, and received our instructions in good part, except two who were inclined to resent any interference and objected to orders for improvement, but an intimation that refusal or neglect to at once abate the nuisances would bring about a prosecution had the desired effect.

The lack of a sewerage system materially adds to the unsanitary conditions, especially during the warm weather, as the abominable pit closets, unprotected from flies, were much in evidence.

At a meeting with the local Board of Health I strongly urged them to take up the question of a sewerage system, but in the meantime to have the pit closets abolished and the bucket system with dry earth system established and attended to by a civic scavenger, who also would gather all the garbage at short intervals.

I also advised the licensing of eating-houses, confectioneries, etc., so as to give a better control, and also by-laws as to the exposure of foodstuffs.

All was considered favorably by the Board, and I hope to learn of a satisfactory result.

R. W. Bell,
Provincial Inspector of Health.

July 6th, 1912.

REPORT *RE* NUISANCE AT WHITBY.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—On Thursday, 4th inst., I visited Whitby for the purpose of looking over some drains reported as being so offensive as to constitute a nuisance. Mr. Thompson, Member of the Board of Health, and Dr. Warren, M.O.H., accompanied me over the whole situation, and we were joined by Mayor Downey and Mr. Willis for a portion of it. I find there are two creeks running through the town to the harbour, and many drains lead into these, there being no regular sewerage system. These drains are mostly open, but here and there covered and frequently choked up from excessive growth of weeds and rubblish thrown into them.

Originally intended for surface and cellar drainage, unfortunately house connections have been permitted to be made until they have become an abomination and nuisance to those living along their route, as well as a danger to many wells still in use.

It is also quite possible for the Civic Water Supply to be contaminated, as the outlet of the creeks is not far distant from the intake.

The remedy is a proper sewer system, which I am informed the town cannot financially stand at present. Meanwhile, however, I advised the abolition of cesspools and the cutting off of all house connections illegally made with these drains.

R. W. Bell,
Provincial Inspector of Health.

Toronto, July 8th, 1912.

REPORT *RE* NUISANCES AND POLLUTION OF STREAM FROM CEMENT WORKS AT ORANGEVILLE.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—As instructed by you, I visited Orangeville on 5th inst., to enquire into nuisances and pollution of a stream. With Dr. Carson, M.O.H., I went over the whole situation. There is a good water but no sewerage system in the town. Cesspools are common, and also drains mostly open, but occasionally indifferently

covered. Many private house connections have been made with these, although only intended for surface or cellar drainage. As only flushed by spring freshets or heavy rains, they give off most offensive odors. One of these, which is a small badly polluted rivulet, forms a shallow pond a few yards wide, held back by a dam constructed for the use of a mill not now operated and increases the nuisance by its offensiveness. The town wants the owner to drain the pond, but he refuses to do so, as he is not responsible for its pollution, and this is quite true, as it is the result of the unwise permission of the town allowing domestic sewage connections. I fear that drainage of the pond would make matters worse unless all sewage pollution is stopped. The remedy is to cut off all house connections, as they have been made without legal permission, abolish all cesspools as well, and adopt a system of dry earth closets until such time as a proper sewer system is established.

Re Cement Works.—Here I found a large flow of hot water with considerable oil in it being carried down through part open and part tile drain a few hundred yards to a small stream, which a few yards further on empties into the River Credit. In this small stream the oil was seen freely spread over its surface and is reported injurious to the fish further down. From information received from the Superintendent of the works and calculations made we concluded at least two gallons of oil per day pass into the stream, a very small portion occasionally being skimmed from a catch basin. I understand the Cement Company has had trouble with a farmer through whose lands the drain runs, and only after legal action was taken placed tile in a section of the drain to carry the pollution past the damage point.

Certainly some other method of disposing of the waste oil should be adopted, and contamination of the stream stopped.

R. W. Bell,
Provincial Inspector of Health.

Toronto, July 8th, 1912.

REPORT *RE* SEWER EXTENSION IN GALT.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—On the 17th inst. I visited the town of Galt *re* extension of sewer, and with Mayor Scott, Dr. Vardon, M.O.H., and Mr. Edward Puce, Town Engineer, and others drove over the proposed route.

The proposed extension is for surface drainage only of the eastern part of Ward 2. Domestic sewage is already provided for, but the sewer is not large enough for both.

The proposition is to lay 3,400 feet of 30-inch tile across the Mackenzie farm outside the town to Moffatt's Creek, a small stream which empties into the Grand River about two-thirds of a mile further down. Part of the farm spoken of is already divided into lots and will eventually be included in the town. The creek is fed from springs and never goes dry. The banks are low down in some places and flooded during spring freshets. Mostly pasture land through which it flows. I visited it at various points from the proposed entrance of sewer to its mouth. A concrete dam a short distance above its mouth forms a pond, from which the ice supply of the town is taken. This is dry in summer, but flooded and run off again in fall to clean it out.

The only objections I heard to the proposition were from a couple of farmers who feared greater flooding of their pastures, but as they through carelessness caused almost complete damming of the stream at various points through their farms, these were not considered—in fact they do not come under our purview from a sanitary point of view. As the ice is taken in midwinter from the pond flooded from the spring water and when no surface drainage, I see no objection to its use.

As to the pollution of the creek or river beyond at spring freshet or after heavy rains, I do not think there will be any danger, as the engineer has provided for a settling and filtering tank at sewer outlet, if considered necessary.

I would advise that it be required, and, with this proviso, recommend that the proposition be approved.

R. W. Bell,

Provincial Inspector of Health.

June 18th, 1912.

Addendum.

To-day, July 9th, 1912, I again visited Galt and had a conference with the Boards of Health of the Town, and Township of N. Dumfries. The parties through whose farms the Moffatt Creek runs admitted that none of them use it for domestic purposes, but only for watering stock. Their grievance was that they had not been consulted by the town authorities prior to my previous visit, and fears were expressed by Dr. A. Thompson, M.O.H. for the township, that the 30-inch tile and the tank were not large enough. However, the Engineer states in the specifications that he has in them made ample provision for the greatest possible flow. At the close of our conference all parties appeared to be fairly well satisfied to accept the approval of our Board, but a small committee from each municipality was appointed to consider and arrange any further objections on the part of the township.

R. W. Bell,

Provincial Inspector of Health.

REPORT *RE* NUISANCE AT STRATFORD.

To the Secretary of the Provincial Board of Health, Ontario.

Sir,—On the 10th inst. I visited Stratford to enquire into a nuisance said to exist caused by the Gas Works. With Dr. Robertson, M.O.H., I looked over the situation. I found a considerable quantity of fluid which emits a bad odor passing through a series of open underground tanks in rear of the works, thence into a small creek on the street side, known as the Erie St. Creek. A few yards below and beside the creek is a clothing factory, the employees in which complain of the odor. The creek here crosses the street and running a short distance in rear of three or four private houses, joins a similar creek which is no better than an open sewer, and together they empty into the river Avon within the city limits. On the banks of the creeks, as well as in them, there was much filth deposited, all tending to render the condition very unsanitary.

Formerly the waste from the Gas Works was forbidden entrance to the city sewers, because of the tar it contained, but the manager now states there is no tar in it, and only ammonia as a pollution, and he intends applying for permission to connect with them and so remove the nuisance from the street.

Considerable nuisance exists independent of the Gas Works requiring abatement in this immediate neighbourhood. The whole question of the pollution of the river from city sewers, etc., is one requiring to be dealt with at an early date.

R. W. Bell,
July 11th, 1912. *Provincial Inspector of Health.*

REPORT *RE* GRIMSBY BEACH.

To the Secretary of the Provincial Board of Health, Ontario.

Sir,—This summer resort was visited by me on Monday, 15th inst., owing to complaints regarding its unsanitary condition. Several years ago I visited the park, and, bad as were some of the conditions then, they are infinitely worse now. The park is now owned and managed by Mr. H. H. Wylie. There is a resident population of probably 1,500 during the summer months, very much congested owing to the proximity of the cottages, about 300. Large picnic parties are there almost daily numbering up in the hundreds, and sometimes thousands, and it is to these the manager caters, as all manner of amusements are provided, together with foods and refreshments, etc. The cottage owners have long leases of their lots, many of them so small the house covers the whole lot, and no provision for family closet accommodation. Several community closets have been erected of the pit variety containing from eight or ten to twenty seats, and these are used in common by the resident cottage owners and picnic parties, the accommodation being quite inadequate and most unsanitary owing to the carelessness of the transients. The cottage owners are under the impression that the park manager is required to provide them with these conveniences, but he denies that responsibility, and says they use them under sufferance and they are only provided for the use of picnics. He admits being responsible for an adequate water supply, street cleaning, and lighting. He also pretends to provide for daily garbage removal on payment of a monthly fee, but there is evidently just cause for complaint regarding this matter, as only a one-armed man is employed to look after nearly 300 cottages.

The two hotels situated in the park are provided with flush closets leading to cesspools, and I fear one of these is connected to a drain which carries kitchen slop to the sand beach close to the wharf where stinking sewage was seen, as also two vile closets. These I ordered removed within 24 hours and the drain diverted from the lake within a week, the water for all but drinking purposes being pumped from alongside the wharf about 100 feet distant.

About fifty cottage owners have provided themselves with patent sanitary closets, which to some extent relieves the situation, and I advised Mr. Wylie to post notices forbidding the remaining residents the use of the community closets, thereby compelling them to provide their own conveniences. He was also ordered to at once put the present closets, which are now a horrible nuisance, in as thoroughly a sanitary condition as possible and keep them so for the remainder of this season, after which they must be abolished entirely, and only such provision made for the future as shall be approved by the Provincial Board of Health.

Mr. A. O. Bowslaugh, Sanitary Inspector of the Township of Grimsby, in which the park is situated, went over the whole situation with me, and I left the carrying out of my instructions in his hands, but I fear more pressure from your Board will be required before this delightful resort is put in a satisfactory sanitary condition.

R. W. Bell,
Provincial Inspector of Health.

Toronto, July 16th, 1912.

REPORT *RE* TANNERIES AT BARRIE AND ORILLIA.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—On Friday, 19th inst., I visited the premises of the Barrie Tanning Co., situated at the west end of Kempenfeldt Bay. All fluid waste is discharged into the bay a few yards distant through an open drain. This consists of the washings of raw hides, lime solution and leather washings of a dark red color, polluting the bay water to a considerable extent, and doubtless creating a nuisance which should be abated. The owners are anxious for sewer connection if brought within reach of the tannery, but that would not lessen the pollution of the bay water, only transfer it to another point, as all the town sewers empty into it; a further condition the abatement of which has already been ordered. Other provision than the pollution of the bay, however, should be at once adopted by the tannery.

On Saturday the 20th inst., with Dr. McLean, M.O.H., Orillia, I visited the tannery of Millar and Son in that town. A large business is done here in tanning harness leather. The buildings are situated on what was at one time very swampy ground, low and flat, but now fairly well drained. Into an open drain leading off to the east is discharged all the liquid waste, a dark reddish colored fluid from the washings of the leather, but containing considerable quantity of lime, admittedly over two bushels per day. The washings off the dirty fresh hides, together with the salt from them, also pass into this drain, all ultimately reaching Lake Couchiching about 500 yards distant and polluting its waters to a considerable extent. The matter is all the worse now, as the civic water supply from their wells is not sufficient and an extra supply is being pumped from this lake. As the pumping station is not far distant, it is quite possible for some of this pollution to reach the intake. Other provision for the disposal of this waste should be at once made.

R. W. Bell,
Provincial Inspector of Health.

July 23rd, 1912.

REPORT *RE* NUISANCE FROM DRAINS IN MERLIN, COUNTY OF KENT.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—I visited, as instructed by you, the village of Merlin, *re* complaints of a nuisance from drains therein. Merlin is an incorporated village in the County of Kent, with a population of about 500. The main street running north and south is the line between the Townships of Raleigh and East Tilbury, and another

street crossing at right angles is known as the Middle Road. Along both sides of these streets are ditches mostly open, about 4 feet deep and 6 to 8 feet wide, in which there is much stagnant water and sewage, the flow being obstructed by rushes and weeds to such an extent as to almost obscure the bottom. At various crossings, however, the filth was seen to the depth of a foot or two, and on being stirred up gave off a most disgusting odor. Several houses have modern conveniences connected with these drains, all of which have been made without permission. The flow in the drains is northward and about 1½ miles to the "Hickey Drain," thence eastward several miles to the River Thames. Cattle almost daily without a herder wander through the ditches stirring up the foul mess. A new canning factory, just starting operations, has a connection to one of the drains and if permitted will add greatly to the pollution.

I met the Medical Officers of Health of both townships, also several members of the local Boards of Health, and advised that all closet connections be ordered cut off at once and if not obeyed the delinquents to be prosecuted, also that the by-law *re* cattle on highways without an attendant be enforced. The drains are also to be thoroughly cleared of weeds and other obstructions and a free flow given to the water from rains and freshets. If this is done the nuisance will be readily abated.

All of which is respectfully submitted.

R. W. Bell,
Provincial Inspector of Health.

July 31st, 1912.

REPORT *RE* IVY LEA SUMMER RESORT.

To the Secretary, Provincial Board of Health, Ontario.

Sir,—Complaint having been made regarding sanitary conditions and pollution of the waters at this summer resort, I, as instructed by you, investigated the matter on 6th inst. This place is situated on the bank of the St. Lawrence River, in the County of Leeds, and consists of several boarding houses and over twenty cottages. I visited twenty-five of them. Several cottages are combined with their boathouses directly over the water. Most of them derive their water supply from the river. All of the boarding houses with accommodation for from 30 to 50 persons have flush closets, and with two exceptions also several cottages empty into the river, the remaining cottages having pit closets, the soakage from which may in some cases reach the water. The sewer outlets are all in close proximity to the intakes within a few feet of them. I am informed there are a dozen or more cottages on adjacent islands with modern conveniences and depositing all their sewage into the water.

At all places visited I warned the persons seen that all pollution of the water must cease, but as in most cases the party seen was not the responsible head, it will be advisable to write officially to each one with specific orders. The boarding houses may require a little time to make the necessary changes, but most of the cottage owners can do so at once wtth but little inconvenience.

A list is hereby appended.

R. W. Bell,
Provincial Inspector of Health.

August 9th, 1912.

REPORT *RE* POLLUTION OF WATER AT KINGSVILLE.

To the Secretary, Provincial Board of Health, Ontario.

SIR,—As instructed by you, I visited Kingsville yesterday, October 9th, and looked over the sanitary conditions of the town, particularly with reference to the pollution of the water supply. Dr. Jenner, M.O.H., informed me that there had recently been several cases of typhoid fever in town, probably caused by infected water supply. There are no wells in town, the supply being derived from Lake Erie, the intake extending out 1,600 feet into the lake a little west of the breakwater. A small creek runs through the western part of the town and discharges into the lake a few hundred yards west of the intake. A storm sewer empties into this creek a short distance above its mouth. A number of citizens having modern conveniences in their houses have cesspools to receive their domestic sewage, but the overflow from these cesspools discharges directly into the storm sewer and thus directly reaches the lake. There is, therefore, every probability of the civic water supply being contaminated.

The creek is also constantly polluted from a woolen mill located beside it in the north part of the town, the dye wastes—aniline dyes with various acids, etc.—being regularly discharged into it. The managers of this mill admitted the pollution and defiantly asserted they would continue to utilize it for their waste dyes, etc., unless the Provincial Board of Health provided other suitable means for their disposal, and if the Board otherwise attempted to interfere they would see to the destruction of the Board. The Canning Factory in town also discharges a lot of waste material which will undergo decomposition and reaches the lake a few hundred yards east of the intake. The King's Hotel, where there had been two cases of typhoid fever, I also found to have urinals and basins, etc., connected directly with the sewer, but not even trapped. I gave instructions for this to be remedied without delay.

After my inspection I had a very pleasant conference with the Mayor, the Medical Officer of Health, and several members of the Municipal Council and Local Board of Health. I advised *re* necessary steps to stop pollution of water supply, abolition or control of cesspools, pit closets and other unsanitary conditions; also urged employment of a sanitary engineer to prepare a suitable civic sewer system, all of which were well received, and I have no doubt my visit will result in much improved conditions ere long.

R. W. BELL,
Provincial Inspector of Health.

Toronto, October 10th, 1912.

REPORT *RE* DRAINS AT MILTON.

To the Secretary, Provincial Board of Health.

SIR,—As instructed by you, I visited Milton on Friday, 8th inst., to look into a reported nuisance caused by municipal drains, etc. I found the south-western section of the town a low-lying flat naturally receiving considerable drainage from the high ground to the west in the adjoining township. Residents of this low ground have cut drains through their lots to the street sides, and these have been continued by the municipality along the streets until they reach other private drains across other lots, and so on, from the neighborhood of the G.T.R. Station

across several blocks until the property of Mr. Hamilton is reached on the south-east side of Robert Street, and from there continues through his lots and some adjoining farm lands to 16-mile creek, a few hundred yards distant. The municipality is at present deepening several of these drains, and into them is discharged the drainage from a large section of the town built on higher ground.

While ostensibly only for surface drainage, a large number of houses have been connected with them by tile drains to carry off their domestic sewage. Much of this was seen deposited along the sides of the drains, and complaints were made to me of cellars being flooded with this sewage after freshets or heavy rains, such as had occurred a day or two before my visit. During the dry season the filth on the sides and bottoms of the drains is exposed and emits a most abominable stench. The owners of the farm lands refusing to clean out the drains across their property, they have become pretty well filled up, with the result that Mr. Hamilton gets the bulk of the sewage which overflows an acre or two of his ground and creates a serious nuisance.

The whole situation is bad and is without doubt a menace to the health of the community. Complaints have frequently been made to the town authorities, but without avail. About three years ago the County Buildings were connected with these drains, but on attention being called to the matter the County Council had a septic tank and subsoil tile put in to care for their sewage, and their surface drainage diverted in another direction.

The town has not for two or three years appointed any Medical Officer of Health, and the Board of Health has been virtually asleep, only expecting to be called together in the event of an outbreak of any infectious or contagious disease.

A suggested visit to the High and Public Schools took me to them, and there with Mr. Marcelle, principal, I went through all the rooms and premises. I found the rooms very badly ventilated, the closets rather dilapidated, windows all broken, roof leaky causing seats to become wet and as a result the children stand on them, the urinal trough all rotted and useless; in fact, the place is quite unsanitary.

Later I met with some of the members of the Town Council and Board of Health, and discussed the whole situation, but no inclination was shown to do anything to remedy the admittedly undesirable state of affairs, some saying Mr. Hamilton had nothing to complain of, the drains were the natural course for the flow of water and, in any case, the town could not afford the expense. An engineer from Guelph had been employed three years ago and again last July to advise with them, but it was evidently in regard to improving the present drains, although he pointed out how the sewage could be diverted at the Main Street. I pointed out that the sewage could not be discharged untreated into the creek at any point in its course.

R. W. Bell,
Provincial Inspector of Health.

November 12th, 1912.

REPORT *RE* MIMICO PIGGERY.

To the Secretary of the Provincial Board of Health.

Sir,—As instructed by you, I inspected to-day the premises of Mr. Alderson, used as a piggery, situated on the south side of College Street, and on the bank of Mimico Creek, in the Township of Etobicoke. There are two frame buildings,

each about 150 feet by 32 feet, and one and one-half stories high, used as pens (48), besides smaller ones nearby and a slaughter-house, the latter not used as such for a year or more. There is a row of outside pens alongside of each of the long buildings, with cement floors which drain into a cement gutter. The gutter next the creek empties into an underground tank about ten feet distant, and this directly into the creek ten feet farther away.

On the opposite side the gutter appears to drain into a hollow in the ground close by, forming a cesspool, but this latter gutter is dry at present, although green slimy water is in the pool.

The liquid filth does not undergo any treatment whatever, but enters the stream as raw sewage, polluting it to a very great extent, and leaving considerable deposit along its banks. This, being directly contrary to the provisions of the Public Health Act, should be abated.

In addition, the whole premises are without doubt a nuisance because of the odors, deposits, and cesspools adjoining. A certain amount of solid refuse is carted across the street and deposited in a vegetable garden, where it is occasionally covered for a time and dug in.

I have sent a similar report to this to Etobicoke Board of Health to-day and called attention to sections 73 and following of the Public Health Act, particularly 79, 81 and 91, under which this nuisance may be dealt with. There are at present about 200 hogs on the premises, and I am informed there are at times in summer from 400 to 500.

R. W. BELL,

Provincial Inspector of Health.

Toronto, October 26th, 1912.

SECOND REPORT *RE* MIMICO PIGGERY.

To the Secretary of the Provincial Board of Health.

SIR,—According to your instructions, I again inspected the Mimico piggery owned by Mr. Alderson, to-day, November 29th.

As compared with my inspection on October 26th, I now find about 80 hogs instead of 200. With dryer weather and the ground somewhat frozen, the premises appear considerably cleaner, otherwise there has been no change.

The liquid filth, although smaller in quantity, is still discharged into the tank and thence into the creek. The disgusting odor from the premises was perceptible at quite a distance away.

Mr. Alderson stated that he contemplated making changes so as to avoid polluting the creek, but no definite scheme apparently decided upon. He admitted that several hundred hogs were usually on the premises during the hot summer months and the odor bad, but it could not be helped.

This certainly would constitute an abominable nuisance, and be a menace to the health of the nearby residents.

R. W. BELL,

Provincial Inspector of Health.

Toronto, November 29th, 1912.

REPORT *RE* SMALLPOX.

To the Chairman and Members, Provincial Board of Health, Ontario.

GENTLEMEN,—During the past year smallpox has been somewhat prevalent in widely separated sections of the Province, but in many places it was not necessary for me to visit, as the disease is better recognized than it was a few years ago and my aid in diagnosis was not required, and where the local authorities had had previous experience and assistance from me, my aid was not again usually necessary for the enforcement of the Public Health Act.

However, in the first half of the year particularly, I did visit a number of places to investigate the conditions and aid the local health authorities in stamping out the disease. I almost invariably found the infected persons had never been vaccinated. None of the cases which came under my purview were of the confluent type, although several were of a severe discrete character.

Without going into detail I might enumerate the places visited with a few comments:

March 1st. *Grand Valley.*—Here I found a baggageman at the railway station in the crust stage, handling the baggage from the trains. He had been released from quarantine in an adjoining municipality. He was immediately isolated. In the village there were eleven cases in six families, all well looked after by Dr. Berwick, the local M.O.H.

March 12th. *Township of Winchester.*—Here the M.O.H. only knew of one case, but at a meeting of the Board of Health the various members reported rumours current, so with the M.O.H., Dr. McLaughlin, I started about 4 p.m. to drive for several hours through the township and we unearthed several cases in four families.

In one case a blacksmith, after recovery from the prodromal symptoms, had worked daily in his shop all through the eruptive stage, of course more or less in contact with many persons. In another instance I found a boy, son of a general merchant, in a small cross-roads hamlet behind the counter selling goods to customers, while the rash was out on him. From another house, where several cases, milk was being sent to the factory.

March 14th. *Whitby.*—Here I found two well-marked cases in the Ladies' College. These were not recognized by the attendant physician until Dr. Warren, M.O.H., was called in. They were without doubt due to contact with a guest (a traveller recovering from the disease) who was present at an evening entertainment in the College a short time before. He and his parents residing in Whitby disputed the fact of his having smallpox, but your Secretary saw him soon after my visit and was satisfied that had been his disease.

Twelve days later, I again, on March 26th, visited Whitby and found the domestic servant in his parents' house down with smallpox.

April 16th. *Township of Ryerson.*—After one of the worst drives, of over twenty miles, in my experience, from Burk's Falls to Maganetewan and beyond, I with Dr. Freeborn, found cases in this township on the shore of Lake Cecebe, but well isolated. We learned of other probable cases which we could not well reach at the time, but I gave all information received to the M.O.H. of the township at Burk's Falls on my return for further investigation. These cases I think were traceable to Grand Valley.

April 27th. *Township of Charlottenburg.*—Driving ten miles east along the bank of the St. Lawrence from Cornwall I found several cases at Summerstown without an effective quarantine. There had been 59 known cases since January. As the summer tourist season was not far off, and there was a large summer hotel on an island close to this village where all came for mail, it was necessary to take very active measures to stamp out the disease speedily. Another eight mile drive took me to the residence of the Township Clerk, where I had arranged to meet the Reeve and Dr. Robinson, M.O.H. After a very satisfactory conference with these officials, I believe the disease was vigorously dealt with and soon stamped out.

May 20th. *St. Thomas.*—A case seen in hospital, son of the proprietor of a hotel, who had come from Windsor with a rash. A female companion had gone on to Port Burwell, so we warned the M.O.H. in both places—the former to vaccinate and keep under surveillance the exposed party and the latter to disinfect the premises from which they came.

May 23rd. *Waterdown.*—Here the Sanitary Inspector was the patient. He and his wife and children were sitting in the public school playground in rear of his premises watching the erection of a nearby bridge, while the school children were playing around them. He had contracted the disease from a patient he had taken to the isolation hospital at Hamilton, two or three weeks previously. On suspicion that he was developing smallpox, the members of his family had been vaccinated the evening prior to my visit. One of them with a companion had gone off shortly before my visit to the G.T.R. Station nearly three miles distant to take a train to visit friends in a neighboring town. I succeeded by hastening to a nearby house and availing myself of their telephone in reaching the G.T.R. agent and prevented them boarding the train and had them returned to quarantine.

May 26. *Woodstock.*—This Sunday morning I went to the assistance of Dr. Ruttan, M.O.H., owing to a doubt regarding a case in a boarding-house. His suspicion was correct. I saw cases in two other sections of the city, seven in all, so we made arrangements to at once open their isolation hospital, which is well situated, and had all patients removed thereto, and exposed parties vaccinated and also quarantined.

May 27th. *Niagara Falls.*—With Dr. Wilson, M.O.H., I visited and conferred with him regarding cases he had in hand—two families with two and four cases respectively, but all are being dealt with quite satisfactorily.

June 12th. *Hamilton.*—Here I visited two families with Dr. Roberts of your Board. He was having difficulty with an outbreak in the family of a prominent clergyman, the attending physician not reporting the cases as smallpox, and certain members of the family objecting to quarantine and causing considerable unpleasantness. But I have reason to believe my visit aided much in overcoming the difficulty and mollifying injured feelings on the part of the infected household.

July 17th. *Ripley*, in County of Bruce. With Dr. McLennan, M.O.H., I visited five houses and saw seven cases. Some of these had been wrongly diagnosed and reported to him as chickenpox. The disease, I understand, was in three other houses. A conference with the Board of Health aided them in dealing with the situation.

July 30th. *Brantford.*—With Dr. Robinson, acting M.O.H., I visited one family and confirmed the diagnosis of smallpox. Cases in this house had been previously called chickenpox.

December 11. *Waterloo.*—Here, with Dr. Baumann, M.O.H., and Dr. Fischer, I visited four families and saw nine cases. Three of the families were in one tenement house. Two of the cases were traced to Hamilton, one of them directly and the other through Heidelburg. Arrangements were made to segregate these cases in one place. Three more cases developed in these same families within a few hours after my visit, but no more before the end of the year.

December 12th. *Bowmanville.*—I was suddenly called to Bowmanville to diagnose a case in a young man in the Balmoral Hotel. There was no doubt about the case. I advised Dr. Tilley, M.O.H., to have him at once removed, vaccinate all exposed persons and keep them under surveillance, have the hotel effectually cleansed and allow it to be reopened. This I understand was done. Dr. Tilley, M.O.H., into whose hands the patient had been turned, resigned his position two or three days later, but his successor, Dr. Clark, undertook to carry out all I had advised.

This completed my smallpox visitation for 1912. In all cases I urged vaccination of all exposed persons and all others who would consent to it, effective isolation of all patients, followed by careful, thorough, and efficient cleansing and disinfection of all infected premises before raising of quarantine.

Trusting my action in all these cases has been satisfactory to the Board, this report is respectfully submitted.

R. W. Bell,

Provincial Inspector of Health.

December 31st, 1912.

REPORT OF WORK DONE IN THE LABORATORY OF THE PROVINCIAL BOARD OF HEALTH, 1912.

To the Chairman and Members of the Provincial Board of Health of Ontario:

Gentlemen, I have the honor to present you the following report of the routine work done in the Toronto Laboratory of the Board.

In addition to the water outfits sent to medical officers of health hitherto, outfits for the collection of suspected diphtheria exudates, sputa from pulmonary cases, and blood from typhoid suspects have been devised, and are supplied to Medical Officers of Health for distribution to the practitioners of their districts. During the last three months of the year, 4,700 of these were distributed. The move has been found to be a popular one. It has added to the efficiency of our tests and made the results more valuable. Outfits of the old style now only occasionally come in. Distribution through the Local Health Officers has been found very satisfactory. In such districts as it is difficult to distribute in this way the outfits are being sent directly to the physicians. The data cards are being more carefully filled out. As this becomes better done valuable statistics will be possible, and notification made from the information collected, passed on to the Local Boards, of especially typhoid and tuberculosis cases in their jurisdictions.

Provision was made to begin the supply of vaccine against typhoid fever. The intention is to supply this especially for those shifting construction and mining camps of the north, where it is found so difficult always to control all the sources of typhoid infection. These vaccines are to be supplied to health officers for distribution amongst the practitioners of the district on demand. We will send to outlying physicians directly, when it is difficult to reach the Local Health Officers.

Such vaccination is hardly to be recommended for general use. In fixed communities the avenues of infection can more profitably be guarded, but in camps—military and industrial especially, where they are to be moved from place to place, the individual needs more protection. We recommend, this vaccination, for all those looking after typhoid cases in hospitals, nurses about the country, and to physicians personally.

During August, September and October, the facilities of the laboratory were used for instruction to the newly appointed District Health Officers. This work was done in conjunction with the Department of Hygiene of the University of Toronto; one-half of each day was given to this work, by some member of the staff.

The Joint High Commission on International Water Ways decided on a joint sanitary survey for the Great Lakes and their connecting rivers. Your laboratory has been preparing for this work, which will commence as soon as the ice goes off, about April 1st, and continue until about October 1st. Two fully equipped laboratories will be put in the field equipped to make and sterilize their own media, and do their culture work on the spot. These will be shifted from station to station as one bit of work after the other is finished. Each will have a staff of four or five trained workers—unskilled help will be picked up when necessary. Boats, tugs, etc., necessary for the collection of the samples will likewise be taken up locally.

Maps are now being made up for each section of the work, and the sample points marked out. Some meetings with those interested and to do the work on the United States side have been had with the idea of agreeing on standards and

co-ordinating methods. On the results of this joint work a final joint report will be made to the Commission, on which it is hoped legislation will finally be based to change these Great Lake water supplies to safe ones which hitherto by neglect and lack of realization of conditions have been sources of enteric disease to quite an abnormal degree. These water sources should be the best in the land with very little fixing up and care, whereas they have been often a curse.

The following table is a synopsis of the specimens examined during the year:

Diphtheria		1,067
Release from isolation	243	
Positive	92	
Negative	151	
Diagnosis	824	
Positive	210	
Negative	614	
Tuberculosis Sputa		1,462
Positive	339	
Negative	1,123	
Typhoid Bloods		615
Positive	112	
Negative	503	
Cases given the Pasteur Preventive Treatment for suspected Rabies		64
Number of injections given	1,383	
Number of animal brains examined for evidence of Rabies		109
Positive	52	
Negative	57	
Milk analyses done for Local Health Boards		207
Fats	76	
Total Solids	30	
Preservatives	48	
Bacteriological	45	
Extraneous Matter	8	
Water analyses made		1,337
Bacteriological	1,329	
Chemical	8	
Liquors for License Department		426
Anti-typhoid vaccine		2
Miscellaneous specimens		97
Total		6,767

Outfits sent out	
Water (parcels)	391
Diphtheria	1,688
Sputa	1,447
Typhoid	1,573
Total	5,099

There has been an increase of over a thousand samples this year over last. The effects of the convenient outfits is already being felt.

As last year, it will be seen the number of negatives exceeds by a great deal the positives. As before, the reason is probably that more use is being made of the facilities in the diagnosis of doubtful and incipient cases. It is hopeful, especially in the case of tuberculosis as an awakening to the importance of using this very great aid in detecting incipient cases, the case that is particularly important if ever tuberculosis is to be controlled.

The number of samples of liquors examined for the active License Department has nearly doubled.

Mr. H. M. Lancaster has this work specially under his supervision, along with the other very excellent work he is doing for us.

Table showing the counties where samples were collected, by whom, and the percentage of proof spirit found in each.

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
9670		G. E. Morrison	26.46
9671		" "	1.3
9689	Nipissing	J. A. Stewart	22.43
9690	"	"	24.71
9691	"	"	24.53
9692	"	"	24.18
9702			7.62
9703			7.
9723	Simcoe	W. Fisher	0.08
9724	"	"	2.6
9725	"	"	1.
9738		A. T. Rowell	
9739		"	
9864		G. E. Morrison	2.89
9926	Peel	Jno. D. Orr	7.53
9956	Nipissing	J. McKay	7.89
9957	"	"	7.89
9958	"	"	7.3
9959	Thunder Bay	R. Solightly	7.89
60	Nipissing	Jerry Lefebure	6.83
61	"	"	7.8
62	"	A. T. Rowell	7.18
63	"	"	6.30
64	"	"	7.89
65	Halton	W. A. Ferrah	7.3
92	Nipissing	A. T. Rowell	7.
93	Perth	A. B. Creighton	
94	"	"	
95	"	"	2.97
187	Halton	W. A. Ferrah	1.4
188	"	"	12.79
264	Thunder Bay	P. C. Symons	3.32
265	"	"	3.68
266	"	"	6.83
267	"	"	0.8
268	"	"	5.08
269	"	"	5.25
270	"	"	3.85
329	York	J. Johnston	93.23
330	"	"	96.03
331	"	"	101.64
332	"	"	71.5
418	Nipissing	Jerry Lefebure	5.95
419	"	"	6.13
457	"	R. Smith	2.89
458	"	"	2.45
459	"	"	7.89
460	"	"	8.06
461	"	"	7.89
462	"	"	8.60
463	"	"	8.06
464	"	"	21.20
465	"	"	24.53
466	"	"	30.14
467	"	"	28.04
468	"	"	24.53
493	Thunder Bay	P. C. Symons	10.86
494	"	"	2.10
495	"	"	2.8
496	"	A. R. Elliott	3.32
497	"	"	.5
498	"	"	3.15
499	"	W. H. Stringer	5.95
500	"	"	8.41

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
520	Nipissing	W. Fisher	19.1
540	"	J. Lefebure	1.57
541	"	"	8.23
542	"	J. McKay	7.18
543	"	"	8.41
544	"	"	7.89
545	"	"	8.23
546	"	"	3.15
556	Algoma	R. Golightly	3.32
557	"	"	3.5
558	"	"	2.97
569	Thunder Bay	Jno. Moore	2.71
570	"	"	2.71
594	Simcoe	W. Fisher	
595	Nipissing	J. Lefebure	1.57
596	"	J. McKay	8.06
597	"	"	2.1
598	"	"	3.68
599	"	"	7.89
600	"	"	6.13
601	"	"	1.75
602	"	"	8.06
603	"	"	7.89
604	"	"	2.4
605	"	"	2.45
606	"	"	2.45
607	"	"	29.09
608	"	"	
618	Nipissing	J. Lefebure	2.97
619	"	C. W. Percy	15.07
620	"	"	94.63
621	"	"	90.25
622	"	J. Lefebure	7.71
623	"	J. McKay	8.23
633	"	J. Lefebure	1.92
634	"	"	1.92
635	"	J. McKay	23.83
636	"	R. T. Smith	28.04
637	"	"	0.7
638	"	"	32.83
639	"	"	1.92
640	"	"	12.26
641	"	"	8.93
642	"	"	25.06
643	"	"	22.43
644	"	"	29.44
646	"	J. Lefebure	2.45
647	"	J. McKay	13.1437
648	"	J. Lefebure	2.27
649	"	J. McKay	2.27
650	"	J. Lefebure	2.45
651	"	"	2.27
652	"	"	2.45
653	"	J. McKay	30.14
654	"	"	2.45
655	"	J. Lefebure	19.62
656	"	J. McKay	29.96
657	"	J. Lefebure	2.27
658	"	J. McKay	21.73
659	"	J. Lefebure	20.85
660	"	J. McKay	7.53
661	"	J. Lefebure	1.57
662	"	J. McKay	1.57
663	"	J. Lefebure	2.45
664	"	J. McKay	1.57
665	"	"	1.57
666	"	"	2.71

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
667	"	J. McKay	1.92
668	"	"	23.13
669	"	"	2.71
670	"	"	23.13
671	"	"	2.71
672	"	J. Lefebure	2.1
673	"	J. McKay	1.92
674	"	J. Lefebure	2.1
675	"	J. McKay	31.29
676	"	J. Lefebure	3.32
677	"	E. D. Jordon	69.39
710	Victoria	Wm. Thorbury	2.27
711	"	"	2.62
722	Nipissing	J. McKay	2.89
723	"	"	8.41
724	"	J. Lefebure	1.92
725	"	"	1.92
767	York	J. Johnstone	124.07
768	"	"	107.95
769	Nipissing	R. T. Smith	18.22
770	Thunder Bay	A. R. Elliott	3.03
771	"	"	2.1
772	"	"	Seal broken
773	"	"	Seal broken, cork out
774	Nipissing	J. McKay	1.22
775	"	"	23.13
776	"	"	22.43
777	"	J. Lefebure	21.73
778	"	"	22.80
779	"	"	1.92
879	"	R. T. Smith	30.14
880	"	"	24.18
881	"	"	23.83
882	"	"	23.30
914	York	J. Johnston	24.18
915	"	"	20.09
920	Nipissing	J. McKay	22.43
921	"	W. Percy	8.41
922	"	"	5.95
923	"	"	5.95
924	"	"	6.48
979	"	J. Smith	7.71
980	"	"	6.48
981	"	"	5.08
982	"	"	8.06
983	"	"	3.32
984	"	"	5.6
985	"	"	5.78
986	"	"	3.5
987	"	"	25.06
988	"	"	5.95
989	"	"	7.
990	"	"	25.06
991	"	"	7.18
992	"	"	23.13
993	"	"	5.78
994	"	"	3.32
995	"	"	8.06
996	"	"	5.78
997	"	"	7.
998	"	J. Stewart	8.06
999	Nipissing	"	2.27
1000	"	"	Bottle empty
1001	"	"	7.53
1002	"	"	24.53
1003	"	"	2.97
1004	"	J. Smith	3.03
1005	"	"	3.85

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
1006	"	"	3.32
1007	"	"	5.43
1008	"	"	6.83
1009	"	"	8.93
1010	"	"	3.5
1011	"	"	3.5
1012	"	"	2.1
1013	"	"	8.41
1014	"	"	3.68
1015	"	"	7.89
1016	"	"	7.89
1017	"	"	23.13
1018	"	"	8.93
1019	"	"	8.41
1020	"	"	8.23
1021	"	"	8.06
1022	"	"	8.06
1023	"	"	7.89
1055	York	A. E. Sarvis	7.18
1056	"	"	17.87
1057	Nipissing	J. McKay	31.54
1058	"	Lefebure and McKay	24.53
1059	"	J. Lefebure	31.54
1060	"	W. S. Blackwell	8.58
1061	"	"	7.89
1063	Renfrew	T. J. Roch	124.
1186	Nipissing	J. Lefebure	3.15
1187	"	J. McKay	26.98
1188	"	J. Lefebure	31.54
1189	"	J. McKay	3.15
1227	Brant	R. J. Eacrett	1.92
1228	"	"	1.05
1288	Nipissing	J. Lefebure	20.39
1289	"	H. P. McGrath	25.76
1290	"	"	1.05
1328	York	Walsh and Sarvis	7.53
1329	"	"	8.06
1330	"	"	
1355	Wentworth	Clarke and Nicholson	1.4
1356	Nipissing	J. Stewart	7.
1357	"	"	7.53
1358	Nipissing	J. Lefebure	24.18
1359	"	J. Stewart	3.85
1360	"	"	3.68
1361	"	"	7.89
1362	"	"	23.83
1363	"	"	8.23
1364	"	"	7.71
1365	"	"	6.48
1366	"	"	8.06
1367	"	"	5.6
1368	"	"	4.2
1401	"	H. P. McGrath	2.45
1402	"	"	2.1
1403	"	"	2.1
1404	"	"	4.13
1471	"	R. T. Smith	2.95
1472	"	"	2.62
1473	"	"	7.89
1474	"	"	68.34
1661	"	McKay & Lefebure	2.1
1676	"	Jas. R. Dey	7.
1677	"	"	7.18
1678	"	"	7.36
1791	York	License Branch	(Methyl. Alcohol and Cedar Oil.
1792	Nipissing	R. T. Smith	23.3
1793	"	"	23.13

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
1806	Wellington	Jas. O'Brien	76.23
1807	"	"	76.23
1808	"	"	71.85
1809	"	"	73.60
1810	"	"	73.60
1811	"	"	73.6
1812	"	"	71.85
1813	"	"	71.85
1814	"	"	75.35
1815	"	"	70.08
1880	Lanark	J. J. Morris	5.78
1881	Nipissing	H. P. McGrath	0
1882	"	"	0
2000	York	Sergt. Murphy	2.27
2001	Nipissing	J. D. McKay	3.41
2002	"	"	3.41
2003	"	"	3.41
2045	"	R. T. Smith	25.06
2046	"	"	24.71
2047	"	"	24.71
2048	"	"	23.83
2117	Nipissing	J. Lefebure	1.92
2118	"	"	1.92
2119	"	W. Blackwell	2.27
2120	"	"	2.5
2121	"	"	3.5
2122	"	"	2.45
2123	"	"	2.45
2154	Lanark	McGregor	7.36
2155	Nipissing	W. Blackwell	7.53
2156	"	"	7.71
2157	"	"	7.71
2158	"	"	0.7
2159	Wellington	J. O'Brien	78.91
2160	"	"	79.73
2161	"	"	79.73
2162	"	"	78.91
2239	Algoma	F. A. Van Norman	3.32
2276		Dept.	24.0
2277		"	24.71
2313		"	2.27
2314	Victoria	W. Thornbury	1.75
2315		Prov. Police	2.10
2316		"	2.15
2380	Grey	Sarvis & Waldeck	1.05
2381	"	Prov. Officers	1.22
2553	Nipissing	J. D. McKay	
2554	"	R. T. Smith	7.71
2555	"	"	2.80
2556	"	"	7.80
2557	"	A. T. Ravell	8.23
2558	"	"	5.43
2659	"	"	2.27
2755		Dept.	61.86 (over proof)
2874	Swastika P.O.	O. Robertson	2.45
2875	"	"	1.75
2876	"	"	3.06
2970	Nipissing	H. P. McGrath	6.48
2971	"	James Dey	6.3
2972	"	H. P. McGrath	7.0
2973	"	James Dey	6.83
2974	"	H. P. McGrath	6.83
2975	Simcoe	W. Fisher	9.98
2976	"	"	12.26
3012	Wentworth	James Sturdy	24.
3013	"	J. Nicholson	1.92
3014	"	"	1.92
3072	Nipissing	H. P. McGrath	5.95
3073	"	"	7.0

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
3074	"	H. P. McGrath	6.45
3075	"	"	5.95
3095	"	J. Lefebure	21.2
3096	Frontenac	G. E. Morrison	23.13
3097		"	15.59
3098	Frontenac	"	24.0
3126	Nipissing	R. T. Smith	11.22
3127	"	"	1,23
3128	"	"	1,23
3230	Dundas	Waldeck & Sarvis	5.08
3231	York	"	4.20
3232	Thunder Bay	John Moore	5.6
3421	York	G. E. Morrison	2.10
3422	"	"	5.43
3446	Simcoe	W. Fisher	2.10
3475	Middlesex	Thos. Magledery	5.78
3542	Wellington	James O'Brien	72.90
3543	"	"	70.92
3544	York	Joseph Dickenson....(over proof)	1.64
3545	"	"	82.19
3546	"	Joseph Geddes	94.19
3547	"	J. Dickenson	87.62
3559	Nipissing	Herman Vick	21.2
3560	"	"	6.74
3614	Simcoe	A. E. Sarvis	2.80
3615	"	Sarvis & Walderk	2.80
3616	Renfrew	J. Connolly	20.85
3617	"	"	2.27
3618	"	"	1.05
3653	Nipissing	J. Lefebure	13.14
3654	York	Dickenson	84.64
3655	"	"	61.19
3656	"	Johnston	61.24
3657	"	"	61.16
3658	"	"	57.91
3659	"	"	33.64
3660	"	"	39.34
3661	"	"	53.45
3662	"	"	50.99
3663	"	"	51.34
3664	"	"	43.19
3665	"	"	62.77
3683	"	Dept.	1.92
3728	Muskoka	H. Boyer	3.32
3729	"	"	1.92
3830	Hastings	G. E. Morrison	10.25
3831	"	"	4.9
3832	"	"	5.43
3833	"	Walderk & Sarvis	10.33
3834	"	G. E. Morrison	10.25
3835	"	"	5.25
3836	"	"	10.33
3837	Nipissing	J. D. R. Jameson	23.13
4027	Northumberland	Sarvis & Walderk	9.46
4028	"	"	6.13
4029	"	"	5.08
4030	Hastings	"	3.85
4031	Northumberland	"	11.21
4032	Hastings	"	1.85
4033	"	"	5.69
4034	"	"	1.75
4035	Norfolk	A. W. Birdsall	20.50
4036	Hastings	G. E. Morrison	3.85
4114	Northumberland	Sarvis & Walderk	3.5
4115	"	"	3.32
4116	"	"	2.27
4142	Grey	Beckett	0.87
4143	"	"	2.36
4144	"	"	2.18

Lab. No.	County.	Inspector.	Per Cent. Proof Spirit.
4186		Dept.	26.28
4187	Grey	"	1.22
4188	"	"	1.05
4244		Morrison	1.05
4245		"	0
4246		"	.52
4247		"	0
4248		"	0
4249		"	0
4250		"	0.35
4284	Peel	A. E. Sarvis	9.63
4453	Middlesex	Galpin	6.30
4454	"	"	0.7
4473	"	"	5.25
4484	"	"	11.91
4557	Simcoe	R. Henderson	1.92
4558	"	"	0.87
4559	"	"	2.89
4560	"	"	0.70
4561	"	"	2.54
4854	"	W. Fisher	7.53

During this year, 109 animal brains were examined for suspected rabies—less than half proved positive typically. It is quite possible that 20 per cent. of the rest would have proved positive if animal inoculation had been done, but as our examinations are made with a view to preventive treatment for the human beings that may have been bitten and that inoculated animals take from 15 to 300 days before they come down, we confine our examination to the search for negri bodies.

It is too bad that it was not more generally recognized that the biting animal should not be immediately killed, but held over for observation. There are cases where the animal is furious. There is nothing, then, to do but kill it. In the great majority of cases, the animal is fairly docile and could be either tied up or confined. When a dog bites because of rabies he is usually well advanced in the disease and has but a few days at most to live, practically never longer than 6 or 7 days. If at the end of 10 days it is still well, there is not one chance in 10,000 that it has rabies. If it should die in the interim, the delay has not been hurtful to the patient bitten. If the animal gets well all thoughts of rabies will be removed—see what a relief this would be to all concerned.

The following table will show approximately the number of brains examined with the counties that supplied them, and also the number of positive rabies amongst them, for the last three years. The disease started in Toronto, in September, 1910. The Western Ontario outbreak started at Niagara Falls a couple of months later. The two outbreaks fused and have since covered Western Ontario. It has not gone east beyond York County.

New York State and the State of Michigan had it before Ontario.

Our outbreaks have originated, the Toronto one from dogs sent in to fanciers from Boston, the Western Ontario one from a dog that came over the bridge at Lewiston from New York State.

It is said that Manitoba and Saskatchewan received theirs from us. It has, however, been prevalent in Minnesota for some years now.

For nearly a year at the beginning of the outbreak a muzzling by-law was put into force. It just about obliterated it, but was finally raised—unfortunately too early. It has not been found expedient to re-establish it. Unfortunately it is getting a stronger and stronger hold. It may soon be necessary to re-establish the quarantine.

REGULATIONS OF THE PROVINCIAL BOARD OF HEALTH *RE* RABIES.

The following "Regulations for the Prevention of Rabies in Man," have been approved of by the Lieutenant-Governor-in-Council:—

That all dogs within the following Counties, namely:—

Brant	Huron	Perth
Bruce	Kent	Simcoe
Dufferin	Lambton	Waterloo
Elgin	Lincoln	Welland
Essex	Middlesex	Wellington
Grey	Norfolk	Wentworth
Haldimand	Oxford	York
Halton	Peel	

must be either securely chained in an out-house or other building, or kept under lock and key, or efficiently muzzled with metallic muzzles in a manner satisfactory to the Inspectors of the Department of Agriculture of the Dominion of Canada. Provided, however, that in any municipality where rabies is actually known to exist, the muzzling privilege may be withdrawn, in which event all dogs must be confined or isolated by being chained up or kept under lock and key.

CHAS. A. HODGETTS,
Secretary.

Toronto, Feb. 9th, 1910.

To Local Board of Health.

Re Rabies.

For the suppression of the further spread of rabies in the Province of Ontario, and for the prevention of its communication to human beings, the accompanying regulations, having been duly approved of, are in force in each and every municipality in the Counties of the Province of Ontario named therein.

Under the provisions of Section 14 of the Public Health Act, it is the duty of the Local Boards of Health in the several Counties to superintend and see to the execution of any regulations made by the Provincial Board, or to execute, or aid in executing the same within their respective districts; and to do and provide all such acts, matters and things as are necessary for superintending or aiding in the execution of such regulations, or for executing the same, as the case may require.

The attention of all Municipal Councils and Boards of Police Commissioners in cities of 100,000 or more is directed to the provisions of Section 540 of the Consolidated Municipal Act, which empower them to pass by-laws and to make regulations as to dogs and the killing of the same, and it is important that these provisions should be immediately enforced by by-law.

It is confidently expected that the hearty support and co-operation of all municipalities along the lines indicated above will result in the suppression of rabies within a few months. Failure, however, on the part of municipal authorities to enforce the regulations and provisions of the Statutes will result in prolonging the period of time during which the regulations will remain in force.

By Order.

Secretary Provincial Board of Health.

DIRECTIONS TO BE FOLLOWED WHERE THE ANIMAL IS SUSPECTED OF BEING AFFECTED WITH RABIES.

It should, if possible, be captured alive, placed in a cage where it can do no harm, and be carefully watched for at least ten days. If affected with rabies, symptoms may appear within forty-eight hours, and death, as a rule, occurs within a few days. Affected animals are scarcely ever known to recover.

In order that other causes of death may be excluded, material should be forwarded to the laboratory for confirmatory diagnosis.

The head may be severed from the body and forwarded by express, packed in sufficient ice surrounded by straw or sawdust.

Full information as to history, clinical symptoms, etc., should also be furnished.

Specimens should be addressed

The Laboratory,
Provincial Board of Health,
Toronto.

ANIMAL BRAINS EXAMINED FOR RABIES.

County.	Year.	Month.	Animal.	Negri. Bodies	Suspicious History.
Wellington	1910	Sept.	Dog	—	—
Halton	"	"	"	+	—
Oxford	"	"	"	—	—
Nipissing	"	"	"	+	—
Wentworth	"	"	"	—	—
Huron	"	"	"	+	—
Peel	"	"	"	—	—
Halton	"	"	"	—	—
Wentworth	"	"	"	—	—
York	"	"	"	—	—
Oxford	"	"	"	—	—
Wellington	"	"	"	—	—
Wentworth	"	Oct.	"	—	—
York	"	"	Cat	—	—
Simcoe	"	"	Dog	—	—
Kent	"	"	"	—	—
Huron	"	"	"	—	—
York	"	"	"	—	—
Wentworth	"	"	"	—	—
Halton	"	Nov.	"	—	—
Lincoln	"	"	"	—	—
Nipissing	"	"	"	—	—
Middlesex	"	"	"	—	—
Halton	"	"	"	—	—
Welland	"	Dec.	"	+	—
Huron	"	"	"	—	—
Kent	"	"	"	—	—
Nipissing	"	"	"	+	—
York	1911	Feb.	"	—	—
Wellington	"	March	"	—	—
York	"	"	"	—	—
York	"	"	"	+	—
Kent	"	"	"	—	—
Welland	"	"	"	+	—
York	"	April	"	+	—
Middlesex	"	May	"	—	—
Peterborough	"	"	"	—	—
York	"	"	"	—	—
Northumberland	"	"	"	—	—
York	"	June	"	+	—
York	"	"	"	+	—
Lambton	"	"	"	—	—
Waterloo	"	"	"	—	—
York	"	"	"	—	—
York	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
York	"	Aug.	"	—	—
Peel	"	"	"	+	—
Middlesex	"	Sept.	"	—	—
Huron	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	—	—
York	"	Oct.	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
Wentworth	"	"	"	+	—

ANIMAL BRAINS EXAMINED FOR RABIES.—Continued.

County.	Year.	Month.	Animal.	Negri. Bodies.	Suspicious History.
York	1911	Nov.	Dog	+	—
York	"	"	"	+	—
York	"	"	"	—	—
Kent	"	"	"	—	—
Middlesex	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	—	—
York	"	"	"	+	—
Huron	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
Huron	"	"	"	—	—
York	"	"	"	+	—
York	"	Dec.	"	+	—
Lincoln	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	—	—
York	"	"	"	—	—
Huron	"	"	"	+	—
Thunder Bay	1912	Jan.	Man	+	—
Thunder Bay	"	"	Dog	—	—
Thunder Bay	"	"	"	—	—
York	"	"	"	—	—
York	"	"	"	+	—
Thunder Bay	"	"	"	+	—
Huron	"	"	"	—	—
York	"	"	"	—	—
Huron	"	Feb.	"	—	—
Huron	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
Oxford	"	"	"	—	—
Thunder Bay	"	"	"	+	—
Wentworth	"	"	"	+	—
Peel	"	"	"	—	—
Huron	"	"	"	—	—
Cobalt	"	"	"	+	—
Simcoe	"	"	"	+	—
York	"	"	"	+	—
Wellington	"	"	"	—	—
York	"	"	"	—	—
Simcoe	"	"	"	—	—
Peel	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	+	—
Haileybury	"	"	"	—	—
York	"	Mar.	"	+	—
Perth	"	"	"	+	—
Simcoe	"	"	"	+	—
Huron	"	"	"	+	—
Huron	"	"	"	—	—
Wellington	"	"	"	+	—
Halton	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	—	Yes
Wellington	"	"	"	—	—
York	"	"	"	+	—
Perth	"	"	Cow	+	—
York	"	"	Dog	—	—
Huron	"	April	"	—	—

ANIMAL BRAINS EXAMINED FOR RABIES.—Concluded.

County.	Year.	Month.	Animal.	Negri. Bodies.	Suspicious History.
Thunder Bay	1912	April	Dog	—	—
York	"	"	"	+	—
Wellington	"	"	"	—	—
Wellington	"	"	"	—	—
Wellington	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	+	—
Northumberland	"	"	"	—	—
York	"	May	"	+	—
York	"	"	"	+	—
Thunder Bay	"	"	"	+	—
York	"	"	Cat	+	—
York	"	"	Dog	—	—
Peel	"	"	"	—	—
York	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
Parry Sound	"	"	"	—	—
York	"	"	"	—	—
York	"	June	"	+	—
York	"	"	"	+	—
Peterborough	"	"	"	—	—
Halton	"	July	"	—	—
Thunder Bay	"	"	"	—	—
Elgin	"	"	"	—	—
Wellington	"	"	"	—	—
Peel	"	"	"	—	—
York	"	Aug	"	+	—
Oxford	"	"	"	—	—
Kent	"	"	"	+	—
York	"	"	"	+	—
Halton	"	"	"	+	—
Perth	"	Sept	"	+	—
York	"	"	"	—	—
Huron	"	"	"	+	—
York	"	"	"	+	—
York	"	"	"	—	—
Elgin	"	Nov	"	+	—
Oxford	"	"	Horse	+	—
York	"	"	Dog	+	—
York	"	"	"	—	—
York	"	Dec.			

The Pasteur preventive treatment for rabies was begun in 1910. This was done to ensure accurate treatment, to avoid delay, and to provide the victims at the lowest price possible, and with the least inconvenience possible, with this desirable treatment.

At the present time the vaccine is being supplied to us through the courtesy of the City of New York. The daily doses are received each day by mail. The treatment usually takes 21 days—in intensive cases 28 days.

The vaccine costs $20.00 for each case. This is the only charge made to the patient. The treatment is otherwise given free.

We have treated in all 167 patients. The greater number of these were bitten by rabid dogs—a few by animals suspected of being rabic.

We have had no ill effects in any of the cases, and so far had no failures.

The following table shows the number of samples and their denominations by the month, with the results for the year 1912.

The following tables show the number of samples of each denomination examined for each town in each County by month.

These sheets are incomplete under each captions except for the last three months of the year, when the new forms were put into use.

The Pasteur treatments, the rabies diagnoses, the milk examinations and the liquors have heretofore been classed en masse with the "miscellaneous."

All of which is respectfully submitted,

JOHN A. AMYOT.

TABLE SHOWING CASES GIVEN THE PASTEUR PREVENTIVE TREATMENT FOR RABIES FROM MARCH 1ST, 1910, TO JAN. 1ST, 1912.

County.	Age.	Sex.	Bitten.	Location of bite.	Character of bite.	Animal injuring.	Rabic or not.	Cauterized.	Hours after.	Caustic.	Began treatment.	Injections given.	Untoward symptoms.	Remarks.
			1910								1910			
Kent	23	male	Feb. 28	hand	slight	dog	+	no	.....	.....	Mar. 4	25	none	
"	35	"	Mar. 2	"	"	"	+	yes	?	?	" 4	25	"	
Haldimand	28	"	Feb. 26	"	"	"	?	"	?	?	" 5	25	"	
"	22	"	Mar. 1	"	"	"	?	no	.....	.....	" 5	25	"	
Waterloo	16	"	Mar. 3	"	"	"	held	"	.....	.....	" 5	17	"	Dog well—discont'd.
Wentworth	19	"	Feb. 26	"	"	"	?	"	.....	.....	" 5	25	"	
"	7	"	" 25	"	"	"	?	yes	?	carbolic	" 5	25	"	
Middlesex	28	"	" 28	"	"	horse	+	no	.....	.....	" 6	25	"	
"	20	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
"	42	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
"	61	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
"	20	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
"	32	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
"	45	"	" 28	"	"	"	+	"	.....	.....	" 6	25	"	
Halton	12	"	" 14	neck	"	dog	+	"	.....	.....	" 6	25	"	
Welland	7	female	" 26	back	severe	"	+	yes	1 hour	?	" 7	25	"	
Waterloo	4	male	Mar. 5	hand	deep	"	+	"	?	?	" 8	25	"	
Wentworth	23	"	Feb. 23	"	slight	"	?	no	.....	.....	" 9	25	"	
"	28	"	" 16	"	deep	"	+	"	.....	.....	" 9	25	"	
Oxford	20	"	" 23	"	slight	"	+	"	.....	.....	" 9	25	"	
Middlesex	53	female	" 28	"	"	horse	+	"	.....	.....	" 10	25	"	
"	30	male	" 28	"	"	"	+	"	.....	.....	" 10	25	"	
Lambton	19	female	Mar. 8	face	"	dog	held	yes	?	carbolic	" 10	13	"	
Durham	14	male	" 3	arm	"	"	+	no	.....	.....	" 10	25	"	Dog well—discont'd.
Wentworth	12	"	Feb. 25	hand	deep	"	+	"	.....	.....	" 12	25	"	
"	50	"	Mar. 1	forearm	"	"	+	yes	2 hours	nitric	" 12	30	"	Nearly had delirium.
Oxford	47	"	" 10	hand	"	"	+	"	10 hours	?	" 12	5	"	
Middlesex	60	male	Feb. 12	neck	slight	horse	+	no	.....	.....	Mar. 12	25	none	
Huron	60	"	Mar. 9	hand	deep	cat	?	"	.....	.....	" 12	25	"	
Wellington	45	"	" 4	"	"	dog	+	"	.....	.....	" 12	25	"	
Waterloo	10	"	" 12	arm	slight	"	+	"	.....	.....	" 14	25	"	
Huron	10	"	" 2	hand	deep	"	+	"	.....	.....	" 14	25	"	
"	17	"	" 10	"	"	cat	?	"	.....	.....	" 10	26	"	
Lambton	42	"	" 7	leg	slight	dog	?	yes	1 hr.	$agno_3$	" 17	26	"	
Norfolk	19	"	" 5	hand	"	"	+	no	.....	.....	" 19	25	"	

Oxford	20	male	Mar.	19	hand	slight	dog	?	no			Mar. 20	25	none	
Huron	17	"	"	11	leg	"	"	+	yes	6 hrs,	cu. so_4	" 21	25	"	
Lambton	20	"	"	14	"	"	"	+	no			" 27	25	"	
Carlton	23	"	"	24	hand	deep	sheep	+	"			" 28	25	"	Needle in Laboratory at Ottawa.
Waterloo	12	female	"	28	"	"	dog	+	yes	1 hr.	?	April 5	25	"	
Brant	32	male	"	31	"	"	"	?	"	2 hrs,	nitric	" 6	25	"	
Perth	23	"	"	24	"	slight	"	?	no			" 8	25	"	
"	28	"	"	24	"	"	"	?	"			" 8	25	"	
Oxford	16	female	"	29	"	"	"	+	yes	?	?	" 12	25	"	
Huron	29	male	April	2	leg	"	"	+	"	1 hr.	nitric	" 13	25	"	
Kent	13	"	"	7	thigh	"	"	?	no			" 15	25	"	
Wellington	4	female	"	12	lip	"	"	?	"			" 15	30	"	
Perth	10	"	"	3	leg	"	"	?	yes	1 hr.	creolin	" 16	25	"	
Oxford	59	"	Mar.	8	hand	"	horse	+	no			" 24	25	"	
"	21	"	"	8	"	"	"	+	"			" 24	25	"	
Waterloo	21	"	April	22	face	"	dog	?	yes	6 hrs.	$agno_3$	" 26	28	"	
"	12	male	"	23	leg	"	"	+	no			" 26	25	"	
Oxford	48	"	"	24	hand	"	"	+	"			" 29	25	"	
"	46	female	"	24	"	"	"	+	"			" 29	25	"	
Lincoln	59	male	May	2	leg	deep	"	+	yes	1 hr.	$agno_3$	May 6	25	"	
"	59	female	"	2	"	"	"	+	"	1 hr.	$agno_3$	" 6	25	"	
Middlesex	7	"	April	30	"	slight	"	+	no			" 10	25	"	
Kent	48	male	May	3	hand	"	ox	+	"			" 11	25	"	
"	35	"	"	3	"	"	"	+	"			" 14	25	"	
Huron	43	"	"	12	leg	"	dog	+	yes	1 hr.	turps.	" 21	25	"	
"	50	female	"	12	hand	deep	"	+	no			" 28	24	"	
"	25	male	"	31	leg	slight	"	held	yes	1 hr.	$agno_3$	June 3	15	"	Dog well June 13.
"	4	"	Jan.	3	face	"	"	+	"	1 hr.	carbolic	" 23	26	"	
Huron	10	female	June	3	leg	deep	dog	?	yes	1 hour	nitric	July 8	25	none	
Kent	11	"	July	3	"	slight	cat	+	no			" 8	25	"	
Kent	7	male	"	4	arm	"	"	+	"			" 8	25	"	
Oxford	14	"	"	9	"	"	dog	+	"			" 17	25	"	
Kent	35	"	Sept.	15	nose	"	"	+	yes	6 hours	carbol.	Sept. 10	32	"	
Waterloo	42	"	"	3	hand	"	"	?	no			" 16	25	"	
Huron	2	"	"	10	lip	"	"	+	"			" 20	25	"	
Perth	20	"	Aug.	30	leg	"	"	?	yes		nitric	Oct. 29	25	"	
Welland	10	"	Dec.	5	hand	"	"		no			Dec. 12	25	"	
Kent	60	"	"	9	"	"	"	?	"			" 20	25	"	
73		16–f 57–m													
			1911												
York	28	male	Mar.	10	hand	slight	dog	+	no			Mar. 14	25	none	
Welland	5	"	"	20	"	"	"	+	"			" 25	25	"	
"	25	female	"	20	"	"	"	+	"			" 25	25	"	

TABLE SHOWING CASES GIVEN THE PASTEUR PREVENTIVE TREATMENT.—Continued.

County.	Age.	Sex.	Bitten.	Location of bite.	Character of bite.	Animal injuring.	Rabic or not.	Cauterized.	Hours after.	Caustic.	Began treatment.	Injections given.	Untoward symptoms.	Remarks.
			1911											
York	4	male	June 1	face	deep	dog	+	yes	1 hour	carbol.	Mar. 4	27	none	
"	30	female	" 1	hand	slight	"	+	no	.....	.....	" 4	20	"	
"	18	male	" 4	"	deep	"	+	yes	1 hour	nitric	" 8	27	"	
"	5	"	May 31	arm	"	"	+	no	.....	.....	" 15	24	"	
"	42	"	June 14	hand	"	"	+	yes	1 hour	nitric	" 18	24	"	
"	65	"	Oct. 15	"	"	"		"	"	carbol.	Oct. 19	22	"	
"	10	"	" 16	"	slight	"		no	.....	.....	" 19	26	"	
"	3	"	" 16	"	"	"		"	.....	.....	" 19	26	"	
"	27	female	" 16	"	"	"		"	.....	.....	" 19	26	"	
"	7	male	" 18	"	deep	"	?	"	.....	.....	" 20	26	"	
"	45	female	" 23	"	slight	"	?	"	.....	.....	" 25	25	"	
"	19	male	" 23	"	"	"	?	"	.....	.....	" 25	25	"	
Waterloo	23	"	" 28	"	"	"		"	.....	.....	Nov. 1	25	"	
York	16	female	Nov. 7	leg	deep	cat		"	.....	.....	" 15	25	"	
"	3	male	" 10	hand	slight	"		"	.....	.....	" 15	25	"	
"	5	"	" 21	leg	"	dog		"	.....	.....	" 28	25	"	
"	33	"	" 23	hand	"	"		"	.....	.....	" 28	25	"	
"	36	female	" 25	"	"	"		"	.....	.....	" 28	25	"	
"	55	"	" 25	"	"	"		"	.....	.....	" 28	25	"	
"	28	"	" 23	"	"	"		"	.....	.....	Dec. 2	25	"	
"	35	"	Dec. 13	"	"	"		"	.....	.....	" 17	25	"	
"	5	male	Nov. 25	"	"	"		"	.....	.....	" 20	25	"	
25		9–f 16–m												
			1912											
Brant	30	male	Jan. 5	hand	slight	dog	+	no	.....	.....	Jan. 12	25	none	
Elgin	30	"	" 15	arm	"	"	+	yes	1 hour	nitric	" 19	25	"	
"	55	"	" 15	hand	"	"	+	"	1 "	"	" 19	25	"	
"	8	"	" 14	"	deep	"	+	"	1 "	"	" 21	25	"	
York	17	female	" 26	"	slight	"	+	no	.....	.....	Feb. 2	25	"	
"	10	male	Feb. 8	"	"	"	+	"	.....	.....	" 10	25	"	
"	14	"	" 8	"	"	"	+	"	.....	.....	" 10	25	"	
Thunder Bay	39	"	" 6	"	"	"		"	.....	.....	" 10	25	"	
York	49	"	" 4	"	"	"		"	.....	.....	" 10	25	"	

Thunder Bay	29	male	Feb.	6	hand	slight	dog	+	yes	1 hour	carbolic	Feb.	11	25	none		
Perth	7	female	"	13	arm	deep	"	+	"	5 hours	"	"	17	25	"		
"	8	"	"	13	forearm	slight	"	+	"	5 "	"	"	17	25	"		
Simcoe	66	male	"	13	arm	"	"	+	"	1 hour	"	"	21	25	"		
York	8	"	"	17	hand	deep	"	+	no	.....	.....	"	22	25	"		
"	5	"	"	21	"	slight	"	+	yes	1 hour	carbolic	"	24	25	"		
"	22	"	"	21	leg	"	"	+	"	1 "	KoH	"	24	25	"		
"	24	female	"	23	arm	deep	"	+	no	.....	.....	"	27	25	"		
Peel	14	male	"	24	"	"	"	+	"	.....	.....	"	27	25	"		
"	28	"	"	24	leg	"	"	+	"	.....	.....	"	27	25	"		
"	21	"	"	24	"	"	"	+	"	.....	.....	"	27	25	"		
Simcoe	16	"	Mar.	4	nose	"	"	+	"	.....	.....	Mar.	12	32	"		
York	38	"	"	11	hand	slight	"	+	"	.....	.....	"	20	25	"		
,,	6	"	"	16	"	"	"	+	"	.....	.....	"	21	25	"		
,,	56	"	"	18	leg	"	"	+	yes	1 hour	carbolic	"	22	13	"	Stopped heart.	
,,	10	"	"	26	arms	deep	"	+	"	1 "	"	"	29	25	"		
Dufferin	36	"	April	28	hand	slight	cow	+	no	.....	.....	May	2	25	"		
,,	32	"	"	28	,,	"	"	+	"	.....	.....	"	4	25	"		
York	6	male	May	2	face	slight	dog	+	no	.....	.....	May	6	25	none		
"	4	"	"	3	hand	"	"	+	yes	7 hours	?	"	8	25	"		
Thunder Bay	5	"	"	2	neck	deep	"	+	"	5 "	carbol	"	11	29	"		
York	2	female	"	8	head	slight	cat	+	"	1 "	"	"	15	25	"		
"	12	male	"	3	hand	"	"	+	"	1 "	"	"	15	25	"		
"	67	"	"	20	leg	"	dog	..	no	.....	.....	"	24	25	"		
"	42	female	"	18	forearm	"	"	+	"	.....	.....	"	25	25	"		
"	28	"	"	16	hand	"	"	+	"	.....	.....	"	25	25	"		
"	33	male	June	6	legs	deep	"	..	yes	16 hours	?	June	9	25	"		
Huron	30	"	"	12	hand	slight	cow	+	no	.....	.....	"	19	25	"		
"	24	"	"	17	"	"	dog	+	yes	10 hours	?	"	20	25	"		
York	9	"	"	17	leg	"	cat	+	no	.....	.....	"	26	25	"		
"	6	"	"	17	hand	"	"	+	"	.....	.....	"	26	25	"		
"	4	"	"	17	leg	"	"	+	"	.....	.....	"	26	25	"		
"	5	"	"	15	hand	"	dog	+	yes	1 hour	carbol	"	30	26	"		
"	11	female	Aug.	23	leg	deep	"	+	"	1 "	"	Aug.	23	25	"		
"	5	male	"	23	"	"	"	+	"	1 "	"	"	23	25	"		
"	42	female	"	23	hand	"	"	+	"	1 "	"	"	27	25	"		
Brant	5	"	Sep.	11	"	deep	"	+	no	.....	.....	Sep.	17	25	"		
"	34	"	"	11	"	slight	"	+	"	.....	.....	"	21	25	"		
Middlesex	40	male	Oct.	1	leg	"	"	+	"	.....	.....	Oct.	5	25	"		
Brant	32	"	"	5	hand	deep	"	+	yes	1 hour	nitric	"	12	25	"		
Elgin	62	"	Nov.	15	"	slight	cow	+	"	1 "	?	Nov.	19	25	"		
"	23	"	"	15	"	"	"	+	no	.....	.....	"	19	25	"		
"	15	"	"	15	"	"	"	+	yes	1 hour	?	"	19	25	"		
Oxford	60	"	"	20	"	"	"	+	no	.....	.....	"	27	25	"		
York	10	,,	"	20	forearm	"	"	+	"	.....	.....	"	27	25	"		

TABLE SHOWING CASES GIVEN THE PASTEUR FOR TREATMENT—Concluded.

County.	Age.	Sex.	Bitten.	Location of bite.	Character of bite.	Animal injuring.	Rabic or not.	Cauterized.	Hours after.	Caustic.	Began treatment.	Injections given.	Untoward symptoms.	Remarks.
			1912											
York	12	male	Nov. 7	hand	slight	cow	+	no	.....	.....	Dec. 12	25	none	
Oxford	26	"	" 1	"	"	"	+	"	.....	.....	" 5	25	"	
"	20	"	" 1	"	"	"	+	"	.....	.....	" 5	25	"	
"	36	"	" 2	"	"	"	+	"	.....	.....	" 7	25	"	
York	5	"	" 7	arm	"	"	+	"	.....	.....	" 11	25	"	
"	10	"	" 7	hand	"	"	+	"	.....	.....	" 11	25	"	
"	11	"	" 7	arm	"	"	+	"	.....	.....	" 11	25	"	
"	51	"	" 7	thigh	"	"	+	"	.....	.....	" 11	25	"	
"	52	"	" 7	hand	deep	"	+	"	.....	.....	" 11	25	"	
"	13	"	Dec. 7	"	"	"	+	"	.....	.....	" 11	25	"	
"	9	"	" 7	arm	slight	"	+	"	.....	.....	" 12	25	"	
Elgin	10	"	" 8	forearm	deep	"	+	"	.....	.....	" 13	25	"	
York	26	female	" 8	hand	slight	cat	?	yes	1 hour	?	" 13	25	"	
"	.	male	" 7	"	"	dog	"	no	.....	.....	" 26	25	"	
"	14	"	" 7	lip	"	"	+	yes	12 hours	carbol	" 12	25	"	
											" 12	32	"	

1910..... 73 cases
1911..... 25 "
1912..... 69 "
} 167 cases—37 females, 130 males.

Report from Laboratory of Provincial Board of Health of Ontario for the year 1912.

Months.	Diphtheritic Swabs				Tuberculous Sputa		Typhoid Bloods		Pasteur preventive treatment		Rabies diagnosis				Milk								Waters		Liquors for License Department	Doses of typhoid vaccine sent out	Miscellaneous specimens	Total for month	Outfits sent out				
	Release		Diagnosis												Food content		Preservatives		Bacteriological														
																			Tub'rcle Bac.		Pus cells												
	+	−	+	−	+	−	+	−	Cases	No. of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculns	Fats	Total solids	+	−	+	−	+	−	Count	Extraneous matter	Chemical	Bacterial				Water	Diphtheria	T.B.	Typhoid	Total
January	9	10	32	83	33	78	2	46	4	87	dogs	7	8	....	18	4	....	....	....	....	....	....	4	....	....	91	30	....	14	560	....	....	....	....	....
February ...	10	3	25	43	9	98	1	16	12	301	"	11	5	....	21	3	....	18	....	....	....	....	6	....	3	63	33	....	2	683	....	....	....	....	....
March	12	8	16	31	21	97	1	31	5	113	"	10	4	....	2	1	....	1	....	....	....	....	2	....	1	69	98	....	3	526	....	....	....	....	....
April	12	15	22	46	13	107	2	37	....	.....	"	2	6	....	7	4	....	2	....	....	....	....	7	....	....	89	69	....	3	443	....	....	....	....	....
May	10	20	15	45	95	127	3	31	7	146	1 cat, 15 dogs	7	9	....	8	....	....	4	....	....	....	....	8	....	1	142	42	....	3	653	....	....	...	....	....
June.....	6	8	18	39	21	121	3	43	7	147	.....	....	....	....	8	8	....	....	....	....	....	....	9	....	....	100	33	....	6	577	....	....	....	....	....
July	7	5	20	44	36	94	10	62	2	.....	dogs	....	9	....	1	10	....	11	....	....	....	....	....	....	2	153	15	....	1	482	....	....	....	....	....
August	5	10	8	33	33	69	27	52	3	63	"	3	1	....	2	....	....	2	....	....	....	....	....	....	....	193	28	....	1	533	....	....	....	....	....
September ..	1	9	5	36	30	64	17	57	3	66	"	4	6	....	1	....	....	1	....	....	....	....	....	....	....	148	23	....	3	474	....	....	....	....	....
October	4	15	14	54	34	80	16	36	2	42	1 horse, 3 dogs	1	3	....	4	....	....	4	....	....	....	....	9	5	....	145	34	....	1	503	227	530	587	563	1,907
November ..	6	12	20	55	42	79	20	28	5	103	1 cow, 5 dogs	4	2	1	4	....	....	5	....	....	....	....	....	....	1	97	21	....	7	512	75	804	675	794	2,348
December ..	10	36	15	105	42	109	10	64	14	315	dogs	3	4	....	....	....	....	....	....	....	....	....	....	....	....	39	....	2	53	821	89	354	185	216	844
	92	151	210	614	339	1,123	112	503	64	1,383	.....	52	57	1	76	30	....	48	....	....	....	....	45	5	8	1,329	426	2	97	6,767	391	1,688	1,447	1,573	5,099

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Espanola	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Mond	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sault Ste. Marie	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Victoria Mine	....	1	3	....	....	....	....	1	....	....	....	....	....	....
	....	1	3	1	....	1	....	1	....	....	....	....	....	....
Brant—														
Brantford	....	....	....	....	....	1	....	....	1	24	dogs	2	....	....
Purvis	....	....	....	....	....	2	....	....	....	....	....	....	....	....
St. George	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	....	....	....	4	....	....	1	24	....	2	....	....
Bruce—														
Wiarton	....	....	....	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Carleton—														
Kars	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Ottawa	....	....	....	....	....	1	....	4	....	....	....	....	....	....
	....	....	....	....	....	2	....	4	....	....	....	....	....	....
Dufferin—														
Grand Valley	....	....	....	....	....	....	....	....	....	....	dog	1	....	....
Honeywood	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Orangeville	....	....	....	....	....	....	....	1	....	....	....	....	....	....
	....	....	....	1	1	....	....	1	....	....	....	1	....	....
Durham—														
Bethany	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Bowmanville	1	....	1	2	1	2	....	....	....	....	....	....	....	....
Enniskillen	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Millbrook	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Orono	....	1	1	1	....	3	....	....	....	....	....	....	....	....
Pontypool	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	2	2	2	3	1	9	....	....	....	....	....	....	....	....
Elgin—														
St. Thomas	....	....	....	....	....	....	....	....	3	63	dogs	....	3	....
West Lorne	....	....	....	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	1	....	....	....	....	3	63	....	....	3	....
Essex—														
Essex	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Kingsville	....	....	....	1	....	1	....	....	....	....	....	....	....	....
Springville	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Sutherland	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Windsor	....	....	....	....	2	1	....	2	....	....	....	....	....	....
	....	....	....	3	2	3	....	2	....	....	....	....	....	....
Grey—														
Dundalk	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Durham	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Hanover	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Markdale	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Maxwell	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Meaford	....	....	....	....	1	....	....	....	....	....	....	....	....	....

of Health for month of January, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											17									
											17				24					
											3									
											3				39					
															1					
															6					
															4					
														1						
														1	20					
															70					
											2			1						
											2			1	13					
											1									
											1									

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Grey, cont.—														
Owen Sound				1	1									
Priceville					1									
Rocklyn				3										
Shallow Lake					1									
			1	5	4	1								
Halton—														
Georgetown			1	3	1	1								
Milton						1								
Oakville		1	2	2										
Palermo				2										
		1	3	7	1	2								
Haldimand—														
Fisherville				1										
				1										
Hastings—														
Belleville														
Coe Hill								1						
Madoc					1									
Marmora						2		3						
Maynooth						1								
Springbrook						2								
					1	5		4						
Huron—														
Brucefield			1	1										
Ethel								2						
Gooderich				1		1		1			dog		1	
Wingham					1									
Zurich														
			1	2	1	1		3					1	
Kent—														
Chatham						4								
Merlin														
						4								
Lambton—														
Oil Springs														
Sarnia														
Wyoming								1						
								1						
Lanark—														
Almonte						1								
						1								
Lincoln—														
St. Catharines				1	2	3								
				1	2	3								
Middlesex—														
Glencoe				1										
London						1								

of Health for month of January, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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14	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	2	...	...	...	22	...	...	...	...	...
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Middlesex—Continued														
Coe Hill					1									
				1	1	1								
Muskoka—														
Bracebridge			1	2				1						
Huntsville				1		1								
			1	3		1		1						
Nipissing—														
Cobalt						1								
Haileyburg														
North Bay				1		2								
Sudbury				2		1								
Simmins														
				3		4								
Norfolk—														
Delhi				2										
Simcoe						1								
				2		1								
Northumberland—														
Bailieboro'														
Cobourg						1		2						
Colborne			1	1	1			1						
			1	1	1	1		7						
Ontario—														
Oshawa				1										
Uxbridge														
				1										
Oxford—														
Burgessville														
Ingersoll			1	1										
Princeton								1						
Tavistock				1										
Woodstock				1	3			1						
			1	3	3			2						
Parry Sound—														
Burk's Falls								4						
Sundridge				1		1								
				1		1		4						
Peel—														
Palgrave				1										
Mono Road				1	1			1						
				2	1			1						
Prince Edward—														
Picton				1										
				1										
Perth—														
Atwood						1								

of Health for month of January, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															3					
															6					
											3									
														1						
											1									
											4			1	12					
															3					
											1									
											1				12					
											1									
											1				2					
											1									
											2									
											3				12					
											1									
											1				7					
															4					
															1					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		Animal inoculations
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	
Perth—Continued.														
Listowel							1	1						
Monkton						1								
Stratford				1				2						
				1		2	1	3						
Peterborough—														
Havelock				1										
Hastings					1									
Peterborough														
				1	1									
Prescott—														
Vankleek Hill						1								
						1								
Renfrew—														
Renfrew					1									
					1									
Russell—														
The Brook			1	4										
			1	4										
Storment—														
Crysler						1								
Osnabruck Centre						1								
						2								
Simcoe—														
Barrie					1	1		1						
Coldwater					1									
Collingwood					1									
Creemore				1										
Midland						2		2						
Phelpston						1								
Stayner			1	1		1								
Victoria Harbour				1										
Orillia														
			1	3	3	5		3						
Thunder Bay—														
Fort William											dog	2	2	
												2	2	
Victoria—														
Fenelon Falls								1						
Lindsay						2								
Oakwood														
						2		1						
Waterloo—														
Ayr								1						
Berlin						1								
Galt					2	1		1						
New Hamburg						1		1						
Waterloo						2		1						

of Health for month of January, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	19	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	8	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Waterloo—Continued.														
Wellesley	....	....	1	....	....	....	....	....	....	....	....	....	....	....
	....	....	1	....	2	5	....	4	....	....	....	....	....	....
Welland—														
Bridgeburg	....	....	..	....	....	1	....	....	....	....	....	....	....	....
Fonthill	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Fort Erie	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Niagara Falls	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Port Colborne	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Stevensville	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Welland	....	....	....	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	1	2	4	....	....	....	....	....	....	....	....
Wellington—														
Belwood	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Glen Allan	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Harriston	....	....	....	....	1	1	....	....	....	....	....	....	....	....
Guelph	....	....	....	....	1	1	....	....	....	....	....	....	....	....
	....	....	....	....	2	4	....	....	....	....	....	....	....	....
Wentworth—														
Hamilton	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheffield	....	....	....	2	....	....	....	....	....	....	....	....	....	....
	....	....	....	2	....	....	....	....	....	....	....	....	....	....
York—														
Aurora	4	2	....	....	....	2	....	....	....	....	....	....	....	....
Eglinton	....	....	....	2	....	....	....	....	....	....	....	....	....	....
King	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Markham	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Mimico	1	....	8	14	....	....	....	....	....	....	....	....	....	....
Richmond Hill	....	2	....	1	....	....	....	....	....	....	....	....	....	....
Schomberg	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Swansea	1	2	2	....	2	....	1	....	....	....	....	....	....	....
Mt. Albert	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Toronto	1	....	....	....	1	4	....	2	....	....	4 dog	2	2	....
Unionville	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Woodbridge	....	....	....	....	....	....	....	2	....	....	....	....	....	....
Weston	....	....	4	8	....	....	....	....	....	....	....	....	....	....
	7	6	16	27	3	8	1	4	....	....	....	2	2	....

of Health for month of January, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	—	+	—	+	—	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	8	...	...	...	20	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...
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4	4	...	...	...	...	...	...	4	...	...	4	30	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	4	...	...	...	...	...	...	4	...	...	4	30	...	...	122	...	...	...	...	...

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs: Release +	Diphtheritic swabs: Release −	Diphtheritic swabs: Diagnosis +	Diphtheritic swabs: Diagnosis −	Tuberculous sputa +	Tuberculous sputa −	Typhoid bloods +	Typhoid bloods −	Pasteur preventive treatment: Cases	Pasteur preventive treatment: Number of injections	Rabies diagnosis: Animal	Rabies diagnosis: Negri bodies +	Rabies diagnosis: Negri bodies −	Rabies diagnosis: Animal inoculations
Algoma—														
Espanola	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Sault Ste. Marie	....	....	....	....	....	4	....	....	....	....	....	....	....	....
Victoria Mine	....	....	1	1	....	....	....	1	....	....	....	....	....	....
	....	....	1	1	....	5	....	1	....	....	....	....	....	....
Brant—														
Burford	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Bruce—														
Allenford	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Hepworth	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Lucknow	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Ripley	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Tara	....	....	1	3	1	....	....	....	....	....	....	....	....	....
Walkerton	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	1	3	1	5	....	....	....	....	....	....	....	....
Carleton—														
Ottawa	....	....	....	....	2	1	....	2	....	....	....	....	....	....
	....	....	....	....	2	1	....	2	....	....	....	....	....	....
Dufferin—														
Orangeville	1	....	....	....	....	1	....	....	....	....	....	....	....	....
	1	....	....	....	....	1	....	....	....	....	....	....	....	....
Durham—														
Bowmanville	....	....	1	1	....	....	....	1	....	....	....	....	....	....
Millbrook	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Orono	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Pontypool	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Port Hope	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	1	2	....	3	....	1	....	....	....	....	....	....
Elgin—														
Rodney	....	....	1	1	....	....	....	....	....	....	....	....	....	....
	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Essex—														
Comber	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Essex	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Windsor	....	....	....	....	1	3	....	1	....	....	....	....	....	....
	....	....	1	....	1	4	....	1	....	....	....	....	....	....
Grey—														
Dundalk	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Owen Sound	....	....	....	....	....	4	....	....	....	....	....	....	....	....
Priceville	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Rocklyn	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	....	....	....	8	....	....	....	....	....	....	....	....
Halton—														
Georgetown	1	1	....	3	....	1	....	....	....	....	....	....	....	....
Oakville	2	....	5	7	....	....	....	....	....	....	....	....	....	....
	3	1	5	10	....	1	....	....	....	....	....	....	....	....

of Health for month of February, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															8					
															1					
															10					
															5					
															2					
3			3					3			4									
3			3					3			4				20					
															2					
															7					
															8					
															20					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Hastings—														
Eldorado						2								
Madoc						1								
Maynooth						1								
Thedford						1								
						5								
Haldimand—														
Dunnville						1								
						1								
Huron—														
Brucefield	2	2									dog		1	
Clinton					1									
Exeter						1								
Fordwich											dog		1	
Goderich								1						
Zurich								4						
	2	2			1	1		5					2	
Kent														
Blenheim						1								
Chatham						3								
Harwich	1													
Merlin														
Thamesville						1								
Wallaceburg					1	1								
	1				1	6								
Lambton														
Camlachie						1								
Cartwright														
Oil Springs						1								
Petrolia				1										
Sarnia			1	1										
			1	2		2								
Lanark														
Perth				1		1								
				1		1								
Leeds and Grenville														
Cardinal								1						
								1						
Lincoln														
Beamsville						1								
Caistorville						1								
St. Catharines														
Smithville			1											
			1			2								
Middlesex														
Ailsa Craig						2								
Arva														
Granton						1								
London														

of Health for month of February, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															5					
															1					
											1									
											1				14					
											2									
											2				10					
											6									
											6									
											12				17					
															2					
															1					
											1									
											1				4					
											1									
											4									

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Middlesex—Continued.														
Strathroy						1								
						4								
Muskoka														
Huntsville				1										
				1										
Nipissing—														
Haileybury											2dogs	1	1	
New Liskeard						1								
Porcupine														
Selwood			1											
			1			1						1	1	
Norfolk—														
Simcoe				1										
				1										
Northumberland—														
Campbellford						1								
Cobourg						3								
Colborne						3								
						7								
Ontario—														
Beaverton				1										
Oshawa				1										
				2										
Oxford—														
Burgessville						1								
Ingersoll											dog		1	
Plattsville						2								
Princeton				1										
Woodstock						1		1						
				1		4		1					1	
Parry Sound—														
Burk's Falls						2								
Parry Sound						2								
Sprucedale						1								
						5								
Peel—														
Alton				1										
Mono Road						3								
Palgrave						1								
Port Credit									3	69	dog	1		
				1		4			3	69		1		
Peterborough—														
Peterborough						2								
						2								
Perth														
St. Mary's						1								

of Health for month of February, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	—	+	—	+	—	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Perth--Continued.														
Sebringville			2											
Stratford						3	1	2	2	44	dog	1		
			2			4	1	2	2	44		1		
Rainy River—														
Dryden														
Emo						1								
Keewatin						1								
						2								
Renfrew—														
Pembroke														
Renfrew						2								
						2								
Prescott and Russell—														
Hawkesbury								2						
Russell			2	2										
Bourget			3	2										
			5	4				2						
Stormont, Dundas, and Glengarry—														
Lancaster			1											
Maxville						1								
			1			1								
Simcoe—														
Alliston									1	18	dog		1	
Angus					1	1								
Barrie					1	1								
Collingwood						1								
Creemore				2										
Midland						1								
Orillia														
Strand						1								
Thornton											dog	1		
				2	2	5			1	18		1	1	
Thunder Bay—														
Ft. William									2	39	dog	1		
Port Arthur						1								
						1			2	39		1		
Victoria—														
Bobcaygeon						1								
Lindsay					1									
					1	1								
Waterloo—														
Berlin						4								
Galt						4								
Hespeler											dog	1		
New Hamburg	1	1				2								
Wellesley				1										
	1	1		1		10						1		

of Health for month of February, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															56					
										1										
										1					3					
											6									
											6				8					
															11					
															2					
														1						
15			15								3									
										1	4									
											1									
15			15							1	8			1	70					
											1									
											1				34					
															2					
											1									
											3									
											4				18					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tubercu-lous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		Animal inoculations
	+	—	+	—	+	—	+	—	Cases	Number of injections	Animal	+	—	
Welland—														
Niagara Falls	1		1	4										
Thorold					1									
	1		1	4	1									
Wellington—														
Drayton						1								
Guelph								3			2dogs		2	
Mt. Forest				1	1									
				1	1	1		3					2	
York—														
Eglinton	2					1								
Mimico			3	10										
Richmond Hill						1								
Swansea					1	1								
Toronto	1		1			3			6	170	dogs	7		
Unionville						1								
Weston				1		3								
	3		4	11	1	10			6	170		7		

Report from Laboratory of Provincial Board

Algoma—														
Sault Ste. Marie					1	2								
Thessalon								3						
Victoria Mines				1										
				1	1	2		3						
Bruce—														
Ripley						1								
Tara				1										
Wiarton			1											
			1	1		1								
Carleton—														
Ottawa						1								
						1								
Dufferin—														
Orangeville		1				1								
Rosemont				1										
		1		1		1								
Durham—														
Bowmanville	2	1		1		1								
Orono				1										
Pontypool						2								
Port Hope														
	2	1		2		3								
Elgin—														
Rodney				1										
St. Thomas											dog	1		
				1								1		

of Health for month of February, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
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of Health for month of March, 1912.

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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Essex—														
Comber					1									
Essex					1		2							
Kingsville							1		2					
Pelee Island						1								
					2	1	3		2					
Grey—														
Annan					1		1							
Durham							1							
Holstein						1	1							
Maxwell							1							
Owen Sound							3							
					1	1	7							
Haldimand—														
Dunnville							2							
Jarvis		1												
		1					2							
Halton—														
Oakville	2	1	1	3										
Milton												dog	1	
Palermo			1											
	2	1	2	3									1	
Hastings—														
Maynooth Station														
							1							
Huron—														
Brussels									2					
Exeter							1							
Fordwich											2dogs	1	1	
Londesboro'							1							
Goderich									1					
Wingham														
Zurich							1							
							3		3			1	1	
Kent—														
Blenheim					1		1							
Dresden							3							
Chatham				1			5		3					
Thamesville					1									
Wallaceburg							1							
				1	2		10		3					
Lambton—														
Camlachie							1							
Sarnia				1										
				1			1							
Lanark—														
Almonte							1							
Pakenham							1							
Perth							1							
							3							

of Health for month of March, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
1			1					1			2									
1			1					1			2				13					
															9					
															3					
															9					
															1					
														1						
											4									
											4			1	12					
															16					
											8									
											8				10					
															3					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Lincoln—														
St. Catharines														
Middlesex—														
London														
Mount Brydges											dog	1		
Parkhill					1									
					1							1		
Muskoka														
Bala				1										
Bracebridge				1										
Huntsville						3		1						
				2		3		1						
Nipissing—														
Cobalt														
Haileybury														
North Bay						1								
Porcupine														
Silver Centre														
Whitney						1								
						2								
Norfolk—														
St. Williams						1								
Waterford						2								
						3								
Northumberland—														
Brighton					1									
Colborne		1												
Campbellford				1										
Cold Springs						1								
Grafton			1											
	1	1	1	1	1									
Ontario—														
Brooklin						1								
Cannington					2									
Oshawa					1									
					3	1								
Oxford—														
Beachville						1								
Ingersoll								1						
Plattsville					1	1								
Princeton					1									
Tavistock						1								
Tillsonburg						2								
Woodstock					1	2		4						
					3	7		5						
Parry Sound—														
Burk's Falls				1										
Parry Sound						1	1	1						

of Health for month of March, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											1									
											1				1					
											3									
											3				5					
															6					
											10									
											1									
											2									
											1									
											14				16					
															3					
															5					
															4					
											6									
											6				21					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies	Animal inoculations
Parry Sound--Continued.														
Powassan				1		1								
Sundridge						1								
Sprucedale						1		1						
				2		4	1	2						
Peterborough—														
Peterborough						1								
						1								
Peel—														
Alton					1									
Brampton			1											
Caledon E.	2	1	2											
Mono Road		1												
	2	2	3		1									
Perth—														
Atwood					1									
Stratford						1		1			dog	1		
West Monkton		1	1											
		1	1		1	1		1				1		
Prince Edward—														
Picton						2								
						2								
Rainy River—														
Rainy River						1								
						1								
Renfrew—														
Renfrew						3								
						3								
Russell—														
Bourget	6		2	2		2								
	6		2	2		2								
Simcoe—														
Anten Mills											dog		1	
Barrie								1	1	27	dog	1		
Collingwood						1								
Cookstown						1								
Creemore								1						
Elmsvale						1								
Everett						1								
Midland					1	1		1						
Stayner						1								
Stroud						1								
Waubaushene					1									
					2	7		3	1	27		1	1	
Stormont—														
Crysler					1									
Osnabruck Centre						1								
					1	1								

of Health for the month of March, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		Animal inoculations
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	
Thunder Bay														
Port Arthur								2						
								2						
Victoria														
Kinmount						1								
Lindsay						4								
						5								
Waterloo														
Ayr				1		1								
Hespeler			1	1	1									
Waterloo					1	2								
			1	2	2	3								
Welland														
Fenwick						2								
Fort Erie						1								
Niagara Falls								1						
						3		1						
Wellington														
Alma						1								
Elora						1								
Belwood						3								
Guelph				1				2			dog	1		
Harriston								1						
Palmerston				1				1						
				2		5		4				1		
Wentworth														
Freelton						1								
						1								
York														
Eglinton														
Maple			1											
Markham					1									
Mimico			4	6		1								
Richmond Hill								1	1	23	dog	1		
Toronto						2			3	63	4dogs	2	2	
			5	6	1	3		1	4	86		3	2	

of Health for month of March, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	—	+	—	+	—	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															2					
															5					
															8					
											7									
											7				11					
															12					
															1					
											1									
											2									
1	1							1			1	98		1						
1	1							1			4	98		1	217					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Espanola														
Massey				1										
Mond														
Sault Ste. Marie						2								
Victoria Mine				1										
				2		2								
Bruce—														
Chesley						1								
Lucknow						1								
Port Elgin						1								
Tara			1											
Tiverton							1							
			1			3	1							
Carleton—														
Ottawa						1		1						
						1		1						
Dufferin—														
Orangeville			1	2										
			1	2										
Durham—														
Bethany								1						
Bowmanville						2								
Orono														
Pontypool						1								
Port Hope														
						3		1						
Elgin—														
Port Stanley				1										
				1										
Essex—														
Amherstburg						1								
Belle River						1								
Essex						5								
Kingsville								1						
McGregor						2								
Windsor								1						
						9		2						
Grey—														
Annan						1								
Dundalk						1								
Durham						1								
Owen Sound			1			1		1			dog		1	
Rocklyn					1									
Shallow Lake						4								
			1		1	8		1					1	
Halton—														
Burlington				2										
Georgetown				2		2								

of Health for month of April, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
											1									
											1									
											2				6					
															5					
											1									
											1				3					
															3					
											1									
											14									
											15				19					
															1					
											3									
											3				14					
															12					
														1						

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Halton—Continued														
Oakville			1											
			1	4		2								
Haldimand—														
Dunnville						1		2						
Jarvis		1												
		1				1		2						
Haliburton—														
Gelert														
Minden														
Hastings—														
Belleville														
Marmora						1								
						1								
Huron—														
Brussels								1						
Goderich														
Seaforth							1							
							1	1						
Kent—														
Chatham					1	2		3						
Dresden						3								
Glenwood														
Merlin						1								
Ridgetown						1								
Thamesville						1								
Tilbury														
Wallaceburg						1		1						
Wheatley						1								
					1	10		4						
Lanark—														
Allenford			1											
Almonte						1								
Pakenham						1								
			1			2								
Lambton—														
Alvinston						1								
New Dundee						1								
Oil Springs								1						
Sarnia				1										
Arkona														
				1		3		1						
Lincoln—														
Abingdon														
Merriton						1								
Niagara-on-the-Lake														
St. Catharines					1	1		1						
					1	2		1						

of Health for month of April, 1912.—Continued.

Milk											Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.													Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	—	Tubercle Bac. +	Tubercle Bac. —	Pus cells. +	Pus cells. —	Count.	Extraneous matter.		Chemical.	Bacterial.									
															1	8					
												1				4					
												2				3					
												3				3					
												2				3					
												1				3					
												5				22					
												1				3					
												2				8					
												1				6					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Middlesex—														
Appin	....	....	....	....	1	1	....	....	....	....	....	....	....	....
Glencoe	....	....	....	....	....	....	....	....	....	....	....	....	....	....
London	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Parkhill	....	....	....	....	....	2	....	....	....	....	....	....	....	....
	....	....	....	....	1	3	....	1	....	....	....	....	....	....
Muskoka—														
Huntsville	....	....	....	....	....	2	....	....	....	....	....	....	....	....
	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Nipissing—														
Cobalt	....	....	....	....	....	....	....	....	....	....	....	....	....	....
New Liskeard	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Porcupine	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sudbury	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Mond	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Norfolk—														
Port Dover	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Waterford	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Simcoe	....	....	....	....	....	1	....	....	....	....	....	....	....	....
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Northumberland—														
Brighton	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Cobourg	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Colborne	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Castleton	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Grafton	....	....	....	....	1	1	....	....	....	....	....	....	....	....
	....	....	....	....	3	2	....	1	....	....	....	....	....	....
Ontario—														
Saintfield	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Sunderland	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Sundridge	....	....	1	....	....	1	....	....	....	....	....	....	....	....
Port Perry	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	1	....	1	3	....	....	....	....	....	....	....	....
Oxford—														
Ingersoll	....	....	....	1	....	....	....	1	....	....	....	....	....	....
Otterville	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Plattsville	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Princeton	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Woodstock	....	....	....	....	1	4	....	....	....	....	....	....	....	....
	....	....	....	2	1	6	....	1	....	....	....	....	....	....
Parry Sound—														
Burk's Falls	....	....	....	....	....	1	....	....	....	....	....	....	....	....
McKellar	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Powassan	....	....	....	....	....	3	....	....	....	....	....	....	....	....
South River	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Sprucedale	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Parry Sound	....	....	....	....	....	....	....	1	....	....	....	....	....	....
	....	....	....	....	....	6	....	2	....	....	....	....	....	....

of Health for month of April, 1912.—Continued.

Milk											Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																	
				Tubercle Bac.		Pus cells.															
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Peterboro—														
Lakefield														
Peterboro						1		3						
						1		3						
Peel—														
Brampton		1												
Mono Road				1										
Streetsville			1											
		1	1	1										
Perth—														
Atwood						1								
Listowel					1	1								
Milverton						1								
Motherwell											dog		1	
St. Mary's						1								
Stratford						1								
Sebringville														
					1	6							1	
Prince Edward—														
Picton														
Renfrew—														
Pembroke														
Renfrew						1								
						1								
Russell—														
Bourget	1	2		3		1								
	1	2		3		1								
Simcoe—														
Angus						1								
Barrie								6						
Collingwood														
Cookstown						1								
Everett						1								
Midland					1									
Orillia														
Phelpston				1										
Stayner				1										
Waubaushene				1										
				3	1	3		6						
Thunder Bay—														
Fort William											dog		1	
													1	
Victoria—														
Lindsay						3								
						3								

of Health for month of April, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
														1						
														1	5					
															3					
														1						
														1	9					
											2									
											2				2					
											6									
										6					7					
															7					
											1									
			1																	
			1								1				15					
															1					
															3					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Waterloo—														
Elmira						1								
Hespeler	3	3												
New Dundee						1								
New Hamburg	1		1	1										
Waterloo		1												
	4	4	1	1		2								
Wellington—														
Belwood						1								
Elora						1								
Erin						1								
Drayton						1								
Guelph								1						
Harriston						1								
Hillsburg					2									
Morriston											dog		1	
Mt. Forest						1								
Palmerston						1					dog		1	
Rockwood						1		2						
					2	8		3					2	
Welland—														
Fenwick						2		1						
Fort Erie						1								
Niagara Falls						1		1						
Thorold						1								
Welland														
						5		2						
Wentworth—														
Dundas														
York—														
Aurora						1								
Mimico			4	9										
Roches Pt.														
Toronto	2							2			3 dog	2	1	
Swansea		1	1											
Sutton West						1								
Weston	5	6	9	17				2						
	7	7	14	26		2		4				2	1	

of Health for month of April, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Chelmsford						1								
Cobalt			1											
Massey				1										
Thessalon						1								
Sault Ste. Marie						1								
			1	1		3								
Bruce—														
Allenford	3			1		1								
Tara						1								
Tiverton							2							
	3			1		2	2							
Dufferin—														
Grand Valley									1	21	dogs		2	
Orangeville						2								
Sherwood									1	21				
						2			2	42			2	
Durham—														
Bowmanville								1						
Millbrook				1										
Pontypool						1								
Orono		1				1								
Port Hope						1								
		1		1		3		1						
Essex—														
Essex						5								
Kingsville						1								
Leamington						1								
McGregor					1									
Windsor						4								
					1	11								
Grey—														
Annan					1	2								
Dundalk					1	1								
Durham								1						
Flesherton				1										
Maxwell						1								
Owen Sound	2	5			1	1								
Shallow Lake				2		2								
	2	5		3	3	7		1						
Haldimand—														
Caledonia														
Dunnville								1						
Hagersville														
Jarvis				1										
				1				1						
Halton—														
Georgetown						2		1						
Milton						1								
Oakville		4	1	3		1								

of Health for month of May, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															5					
															8					
															48					
4			4					4			26				44					
															12					
															21					
											2									
											1									
											1									
											4				6					
														2						

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Halton—Continued														
Palermo														
		4	1	3		4		1						
Hastings—														
Marmora														
Maynooth				1										
Trenton						2								
				1		2								
Huron—														
Brussels					1									
Dashwood					1									
Goderich				1				1						
Landesboro						1								
				1	2	1		1						
Kent—														
Chatham					1	3								
Dresden						1								
Duart						1								
Merlin						1								
Ridgetown						1								
Wheatley					1									
					2	7								
Lambton—														
Camlachie						2								
Petrolia					1	1								
Oil Springs					1	2								
Sarnia		1		2										
Watford								2						
		1		2	2	5		2						
Lanark—														
Camlachie														
Carleton Place														
Pakenham						1								
						1								
Lincoln—														
Niagara-on-the-Lake														
St. Catharines					2	2								
					2	2								
Middlesex—														
London														
Lucan					1									
Mt. Brydges				1										
Strathroy				1										
				2	1									
Muskoka—														
Bracebridge	1	1	1		1		1							
Huntsville						3								
	1	1	1		1	3	1							

of Health for month of May, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											1									
											1			2	16					
											3									
											6									
											9				12					
															5					
															9					
											15									
											15				27					
											4									
											4				5					
											4									
											4				8					
											8									
											8				11					
															8					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Nipissing—														
Haileybury														
New Liskeard						1								
North Bay						1								
Pt. McNicoll				1										
Sudbury								1						
Swastika				1										
Timmins														
Verner						1								
				2		3		1						
Norfolk—														
Port Dover						2								
Port Rowan						1								
Waterford					1									
					1	3								
Northumberland—														
Brighton								3						
Campbellford											dog			1
Cobourg				1		4								
Colborne					1			4						
Coldsprings														
Port Hope														
				1	1	4		7						1
Ontario—														
Pickering														
Port Perry				2		1								
Saintfield						1		1						
Whitby		2						1						
		2		2		2		2						
Oxford—														
Burgessville						2								
Culloden								1						
Drumbo														
Ingersoll						2								
Plattsville						2								
Tillsonburg						2		2						
Woodstock				1	1	5		2						
				1	1	13		5						
Parry Sound—														
Burk's Falls				1	1									
Depot Harbor				1										
Dunchurch								1						
Sundridge						1								
Parry Sound								1			dog			1
				2	1	1		2						1
Peel—														
Brampton						1								
Caledon E.				1										
Port Credit											dog			2
				1		1								2

of Health for month of May, 1912.—Continued.

Milk											Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																	
				Tubercle Bac.		Pus cells.															
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
												1									
												5									
												4									
												10				16					
																4					
												1			1						
												1				9					
												4				24					
												24				31					
																4					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Perth—														
Listowel							2							
Monkton							1							
St. Mary's							1							
Stratford							3							
							7							
Peterboro—														
Peterboro							1							
							1							
Prince Edward—														
Picton							1							
							1							
Renfrew—														
Eganville							2							
Renfrew							2							
							4							
Russell—														
Bourget			2	2			1							
			2	2			1							
Simcoe—														
Barrie														
Collingwood			1	2	2									
Cookstown							1							
Midland					1		2							
Orillia									1					
Stayner							2							
			1	2	3		5		1					
Thunder Bay—														
Port Arthur							1			1	21	dog	1	
							1			1	21		1	
Victoria—														
Bobcaygeon							1							
Lindsay							1							
							2							
Welland—														
Fenwick							1							
Niagara Falls														
Pt. Colborne							1							
Ridgeway							1							
							3							
Waterloo—														
Ayr			1	1			2		1					
Berlin														
Galt							2							
Hespeler							3							
New Hamburg									1					
Preston			1	1					1					
Waterloo				1										

of Health, for month of May, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															7					
															1					
															1					
															4					
															5					
											1									
											1									
															14					
															24					
															2					
											5									
															8					
										1										

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		Animal inoculations
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	
Waterloo—Continued														
Wellesley								2						
			2	3		7		5						
Wellington—														
Arthur														
Erin						1								
Forest						1								
Drayton						4								
Guelph						1								
Mt. Forest						1								
Palmerston					1									
					1	8								
York—														
Aurora						2								
King					1									
Lambton Mills						2								
Markham					1	1								
Mimico			6	9							dog		1	
Mt. Dennis									2	39	cat	1		
Schomberg				1							dog	1		
Sutton West														
Swansea	1	3	1	3										
Stouffville						1								
Toronto					1			1	1	21	dog	4	2	
Weston	3	3							1	23				
York Mills														
	4	6	7	13	3	6		1	4	83		6	3	
Elgin—														
Rodney						1								
						1								
Total														

of Health for month of May, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	—	Tubercle Bac. +	Tubercle Bac. —	Pus cells. +	Pus cells. —	Count.		Chemical.	Bacterial.									
										1					18					
											11									
											3									
											14				23					
											1									
											2									
4								4				42								
											7									
4								4			10	42			196					
															1					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri - bodies		Animal inoculations
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	
Algoma—														
Blind River						1								
Manitowaning						1								
Thessalon					2			1						
					2	2		1						
Brant—														
Brantford														
Paris						1								
						1								
Bruce—														
Chesley						1								
Kinloss						1								
Paisley						1								
Tara						1								
Walkerton						1								
						5								
Carleton—														
Kars					1									
Ottawa						3								
					1	3								
Durham—														
Bethany						1								
Bowmanville						2								
Newcastle														
Pontypool						1								
Port Hope														
						4								
Dufferin—														
Orangeville	2	1												
Shelburne						1								
	2	1				1								
Elgin—														
Aylmer														
Shedden						1								
						1								
Essex—														
Essex				1	1									
McGregor						1								
Walkerville		1												
Windsor					1	3								
		1		1	2	4								
Grey—														
Annan			1											
Dromore						1								
Holstein				1										
Owen Sound		1			1	3		1						
		1	1	1	1	4		1						

of Health for month of June, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											1									
											1				6					
											5									
											5				6					
															5					
														1						
														1	5					
											1									
											1									
											7									
											9				13					
															4					
											1									
											1				2					
															8					
															9					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Grenville—														
Cardinal						1		1						
						1		1						
Haldimand—														
Dunnville						1		1						
						1		1						
Haliburton—														
Haliburton						2								
						2								
Halton—														
Georgetown	1		1	2		2								
Oakville				1		2								
	1		1	3		4								
Hastings—														
Belleville						1								
						1								
Huron—														
Brucefield			1											
Brussels						1								
Dashwood					1									
Fenwick						1		2						
Goderich								1	2	42				
Kintail					1									
Wingham						1								
Zurich						1								
			1		2	4		3	2	42				
Kent—														
Blenheim						1								
Chatham						2	1	1						
Dresden						1								
Ridgetown					1									
					1	4	1	1						
Lambton—														
Camlachie														
Sarnia					1	1								
Sombra			1											
Watford						2								
			1		1	3								
Lanark—														
Pakenham						2								
Perth								1						
						2		1						
Lincoln—														
Jordan						1								
St. Catharines						6		2						
Smithville						2								
						9		2						

of Health for month of June, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															2					
															2					
															2					
															9					
															1					1
														1						
														1	55					11
															7					1
											1									
											5									
											6				11					
															3					
											5									
											5				16					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Middlesex—														
Ailsa Craig	....	....	....	....	....	2	....	....	....	....	....	....	....	....
London	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Muskoka—														
Bracebridge	....	....	....	2	....	....	....	....	....	....	....	....	....	....
Dwight	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Huntsville	....	....	1	....	....	2	....	....	....	....	....	....	....	....
Gravenhurst	....	....	....	....	....	....	....	1	....	....	....	....	....	....
	....	....	1	2	....	2	....	1	....	....	....	....	....	....
Northumberland—														
Brighton	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cobourg	....	....	....	....	1	....	....	....	....	....	....	....	....	....
	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Norfolk—														
Langton	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Port Dover	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Waterford	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	....	....	....	1	3	....	....	....	....	....	....	....	....
Nipissing—														
Cobalt	....	....	....	....	....	....	....	....	....	....	....	....	....	....
North Bay	....	....	....	....	....	1	....	1	....	....	....	....	....	....
Selward	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sudbury	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Timmins	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	1	1	....	1	....	....	....	....	....	....
Ontario—														
Ashburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cannington	....	....	....	2	....	....	....	....	....	....	....	....	....	....
Port Perry	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Saintfield	....	....	....	....	....	....	....	1	....	....	....	....	....	....
	....	....	....	2	....	2	....	1	....	....	....	....	....	....
Oxford—														
Burgessville	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Drumbo	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Embro	....	....	....	....	1	2	....	....	....	....	....	....	....	....
Ingersoll	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Thamesford	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tillsonburg	....	....	....	....	1	2	....	1	....	....	....	....	....	....
Plattsville	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Woodstock	....	....	....	....	2	4	....	3	....	....	....	....	....	....
	....	....	....	....	4	12	....	5	....	....	....	....	....	....
Parry Sound—														
Burk's Falls	....	1	....	....	....	1	....	....	....	....	....	....	....	....
Depot Harbor	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sprucedale	....	....	....	....	....	1	....	....	....	....	....	....	....	....
South River	....	....	3	3	....	....	....	1	....	....	....	....	....	....
Sundridge	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Powassan	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	....	1	3	3	....	5	....	1	....	....	....	....	....	....

of Health for month of June, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.												
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	6	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	9	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	3	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Peel—														
Mono Road				1										
Streetsville			1											
			1	1										
Peterboro—														
Keene														
Peterboro						2	1	1						
						2	1	1						
Perth—														
Kirkton														
Listowel														
St. Mary's						2								
Stratford						1								
						3								
Prescott—														
Vankleek Hill								1						
								1						
Rainy River—														
Emo						1								
Fort Frances						1								
Kenora														
						2								
Russell—														
Bourget	2	4	2	4		3								
	2	4	2	4		3								
Simcoe—														
Angus						2								
Barrie						2								
Beeton			2	1										
Collingwood					1									
Cookstown			1			1								
Midland						1		1						
Orillia														
Stayner				2										
			3	3	1	6		1						
Thunder Bay—														
Port Arthur								1						
Schreiber														
								1						
Victoria—														
Bobcaygeon						1								
Kinmount						1								
Lindsay					1	1		1						
Little Britain														
					1	3		1						
Waterloo—														
Berlin														
Linwood														

of Health for month of June, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
															2					
											1									
											1				5					
											1									
											1									
											2				5					
															1					
											2									
											2				4					
															15					
											4									
											4				18					
														1						
														1	2					
											1									
											1				6					
														3						
											2									

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Waterloo—Continued.														
Galt							2							
New Hamburg				2	1			1						
				2	1		2	1						
Welland—														
Bridgeburg							2							
Marshville							2		1					
Stevensville							1							
Thorold				1					1					
Ridgeway				1										
Welland				1			1		12					
				3			6		14					
Wellington—														
Belwood									1					
Conn							1							
Elora							1							
Glen Allan														
Guelph							1		1					
Harriston							1							
Mount Forest					1		2							
Palmerston							1							
					1		7		2					
Wentworth—														
Ancaster									1					
									1					
York—														
King				1						3	63			
Aurora						1								
Eglinton				1		1								
Keswick														
Markham				1										
Mimico			3	9										
Sutton West						1								
Swansea	1		1	1										
Toronto				1						2	42			
Weston									1					
Richmond Hill						1								
	1		4	14		4			1	5	105			

of Health for month of June, 1912,—Concluded,

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											2			3	11					
											2									
											1									
											3									
											6				29					
											4									
											1									
											5				15					
															1					
											1									
8	8							9			26	33								
8	8							9			27	33			219					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Chapleau			2	1										
Cutler														
Richard's Landing														
Sault Ste. Marie														
Victoria Mines														
			2	1										
Bruce—														
Port Elgin					1									
Tiverton						1								
Walkerton														
					1									
Carleton—														
Ottawa					1	1		20						
					1	1		20						
Durham—														
Bowmanville			1			3					dog		1	
Enniskillen						1								
Millbrook				1										
Pontypool						2								
			1	1		7							1	
Dufferin—														
Orangeville					1	1								
Shelburne					1									
					2	1								
Elgin—														
Wallacetown						1								
						1								
Essex—														
Comber			2											
Essex											dog		1	
Kingsville						1								
Leamington						1								
Windsor					3	4		1						
			2		3	6		1					1	
Grey—														
Annan				1										
Durham					1	1								
Hanover						1								
Holstein				1										
Maxwell				1										
Owen Sound			1	3		1								
Shallow Lake						1								
			1	6	1	4								
Halton—														
Campbellville						1								
Freeman											dog		1	
Milton						1								
Trafalgar											dog		1	
						2							2	

of Health for month of July, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											1									
											1									
											2				10					
											1									
											1				3					
											1									
											1				28					
															10					
															3					
															1					
											1									
											1				14					
															4					
											4									
											4									

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Hastings—														
Frankford						1								
Trenton						1								
						2								
Haldimand—														
Cayuga											dog		1	
Dunnville						1								
Fisherville								2						
						1		2					1	
Huron—														
Brucefield	1	1												
Exeter					1									
Fordwich					1									
Seaforth				1										
Wingham						1								
Zurich						1								
	1	1		1	2	2								
Kent—														
Chatham				1	1	2	1	2						
Dresden								1						
Merlin					1									
Thamesville											dog		1	
				1	2	2	1	3					1	
Lambton—														
Petrolia						1								
Sarnia														
						1								
Lanark—														
Perth				1										
				1										
Lincoln—														
Grimsby														
Merritton						1								
Niagara-on-the-Lake														
St. Catharines						2								
						3								
Muskoka—														
Bracebridge								1						
Huntsville		1		1				1						
Port Carling						1								
		1		1		1		2						
Middlesex—														
Ailsa Craig						2								
Glencoe				1										
London														
Parkhill					1	1								
				1	1	3								

of Health for month of July. 1912.—Continued,

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															2					
											1									
											1				5					
											2									
											2				9					
															10					
											4									
											4				5					
											1									
											1				2					
											2									
											1									
											3				6					
											1									
											1				6					
											14									
											14				19					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Nipissing—														
Cobalt														
Haileybury						1								
North Bay						2								
Schumacher														
Sudbury						1								
Swastika														
Verner					1									
					1	4								
Norfolk—														
Port Dover						1								
Simcoe								2			dog		1	
Waterford						1								
						2		2					1	
Northumberland—														
Brighton					1									
Cobourg						1								
					1	1								
Ontario—														
Beaverton								1						
Cannington			1											
Oshawa						1								
Port Perry						1								
			1			2		1						
Oxford—														
Plattsville						2		1						
Princeton					1									
Tavistock						1								
Tillsonburg						3		1						
Woodstock					1	2		4						
					2	8		6						
Parry Sound—														
Burk's Falls				2	1									
Parry Sound								1						
Powassan						3								
South River						1								
Sprucedale								1						
				2	1	4		2						
Peel—														
Bolton														
Brampton														
Clarkson														
Dixie														
Port Credit											dog		1	
													1	
Perth—														
Kirkton														
Listowel						1		1						
Mono Road				2										
Stratford								1						
				2	1			2						

of Health for month of July, 1912.—Continued.

Milk											Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																	
				Tubercle Bac.		Pus cells.															
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		Animal inoculations
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	
Peterboro—														
Hastings									1					
Peterboro					1	4	2		2					
					1	4	2		3					
Prince Edward—														
Wellington					1									
					1									
Rainy River—														
Emo					1	1								
Fort Frances				1										
Kenora														
				1	1	1								
Renfrew—														
Eganville						2								
Pembroke														
						2								
Russell—														
Bourget	1			1		1								
	1			1		1								
Stormont—														
Osnabruck Centre						1								
						1								
Simcoe—														
Angus					1	1								
Barrie				1		1			4					
Beeton														
Bradford						1								
Churchill					1									
Cookstown									1					
Creemore				1										
Orillia														
Phelpston			1			1								
Stayner					1	2			1					
Thornton						1								
Waubaushene					1	1								
Collingwood					1	3								
			1	2	5	11			6					
Thunder Bay—														
Port Arthur									2					
Slate River														
									2					
Victoria—														
Kinmount				1										
Lindsay									1					
Manilla									1					
Woodville														
				1					2					

of Health for month of July. 1912.—Continued,

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															10					
															1					
											2									
											2				5					
											25									
											25				27					
															3					
											2									
											1									
											1									
											9									
10			10								1									
10			10								14				59					
											1									
											1				3					
											1									
											1									
											2				5					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Waterloo—														
Galt				1		1		1						
New Hamburg				1		1								
Waterloo						1								
				2		3		1						
Welland—														
Niagara Falls						1	1	3						
Port Colborne						1								
Port Robinson														
Thorold														
Welland														
						2	1	3						
Wellington—														
Belwood				1		1								
Drayton					1									
Elora					1	3								
Erin						1		1						
Fergus					1									
Guelph								1						
Morriston							1							
Palmerston								1			dog		1	
				1	3	5	1	3					1	
Wentworth—														
Sheffield					1									
					1									
York—														
Agincourt						1		1						
Aurora					2									
Birch Cliff														
Eglinton	1	1	2											
Keswick														
Mimico			8	15										
Newtonbrook														
Schomberg														
Swansea	2	2	2	1										
Todmorden														
Toronto					1	1		2						
Weston	2			2										
Woodbridge				1										
	5	3	12	19	3	2		3						
Totals														

of Health for month of July, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
															6					
											6									
											3									
										2	2			1						
											2									
											4									
										2	17				26					
											2									
											3									
											5				19					
															1					
											1									
											1									
											1									
											1									
											1									
											1									
1			1								9	15								
											1									
1			1								16	15								80

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Victoria Mines					1									
					1									
Brant—														
St. George			1		1									
			1		1									
Bruce—														
Chesley					1	1								
Creemore							1	4						
Tara		1		2										
Tiverton						1								
Teeswater														
Walkerton						1								
		1		2	1	3	1	4						
Carleton—														
Ottawa						1	1	4						
						1	1	4						
Dufferin—														
Grand Valley														
Durham—														
Blackstock				1										
Bowmanville		1				1								
Millbrook						1								
Port Hope					1									
Orono				1										
		1		2	1	2								
Elgin—														
Port Stanley						2								
Rodney														
						2								
Essex—														
Kingsville								1						
McGregor						1								
Windsor						4		2						
						5		3						
Frontenac—														
Arden				1										
				1										
Grey—														
Annan			1	1										
Hanover						2								
Holstein					1	1								
Owen Sound						1								
Priceville					1									
			1	1	2	4								

of Health for month of August, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Haldimand—														
Caledonia					1									
Dunnville					1			1						
Jarvis								1						
					2			2						
Halton—														
Campbellville											dog	1		
Nassagaweya								1						
Oakville														
Palermo														
								1				1		
Hastings—														
Frankford														
Marmora					1									
Trenton								1						
					1			1						
Huron—														
Ethel							2	2						
Gorrie						1								
Seaforth							1							
Zurich							2	1						
						1	5	3						
Kent—														
Blenheim							1							
Chatham					1	1								
Duart						1								
Dresden								1						
Ridgetown					1	1								
Wallaceburg				1	1	2								
				1	3	5	1	1						
Lambton—														
Sarnia														
Wilkesport					1									
Wyoming								1						
					1			1						
Lanark—														
Almonte														
Carleton Place								1						
Pakenham					1									
Perth						1								
					1	1		1						
Lennox and Add.—														
Flinton														
Lincoln—														
Niagara-on-the-Lake					1			3						
Welland Port			1			1								
			1		1	1		3						

of Health for month of August, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Middlesex—														
Ailsa Craig						1								
Glencoe					1									
London			1											
			1		1	1								
Muskoka—														
Huntsville				1	1	1								
Port Carling				1										
Rosseau								1						
				2	1	1		1						
Nipissing—														
Cobalt														
Haileybury														
North Bay				1		1								
Porcupine														
Sturgeon Falls														
Swastika						1								
				1		2								
Norfolk—														
St. Williams														
Simcoe					1		5	3						
Waterford					1									
					2		5	3						
Northumberland—														
Warkworth								1						
								1						
Ontario—														
Pt. Perry								2						
								2						
Oxford—														
ingersoll														
Mt. Elgin											dog		1	
Otterville					1									
Plattsville					1									
Tavistock			1			1								
Tillsonburg							1	1						
Woodstock					1	1								
Princeton						1								
			1		3	3	1	1					1	
Parry Sound—														
Burk's Falls				1				1						
Magnetawan				1										
Parry Sound				1										
South River					1									
Sundridge						1								
				3	1	1		1						
Peel—														
Burnhamthorpe		1		1										
Cooksville														
Mono Rd.						1								

of Health for month of August, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.									
											4									
											4				7					
															5					
											8									
											8									
											9									
											1									
											2									
											15									
											43				46					
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											2				12					
															6					
															1					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Peel—Continued,														
Palgrave						2								
Streetsville				1										
		1		2		3								
Perth—														
Atwood														
Kirkton	1	2		2										
Listowel						1	1	1						
Monkton						1								
Stratford					3	2	1	3						
	1	2		2	3	4	2	4						
Peterboro—														
Havelock					1	1								
Lakefield						1								
Peterboro								3						
					1	2		3						
Prescott—														
Vankleek Hill							1							
							1							
Prince Edward—														
Wellington														
Rainy River—														
Keewatin														
Kenora														
Renfrew—														
Renfrew														
Russell—														
Bourget					1									
					1									
Stormont—														
Osnabruck Centre						1								
						1								
Simcoe—														
Angus						1								
Barrie						1	5	2						
Beeton				1										
Collingwood					1	1								
Everett						2								
Midland						1								
Orillia														
Stayner						2		2						
				1	1	8	5	4						

of Health for month of August, 1912,—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	—	+	—	+	—	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Thunder Bay—														
Nepigon						1								
						1								
Victoria—														
Kinmount					1	1								
Lindsay						1		1						
					1	2		1						
Waterloo—														
Berlin						2								
Preston						1								
Waterloo			1			2								
Winterbourne								1						
			1			5		1						
Welland—														
Bridgeburg					1									
Fenwick					1									
Marshville						1								
Niagara Falls							3							
Ridgeway														
Pt. Colborne					1									
					3	1	3							
Wellington—														
Belwood						2		1						
Elora						1								
Guelph								1						
Harriston							2							
Hillsburg						1								
Rockwood				1										
				1		4	2	2						
York—														
Agincourt				1										
Aurora						1								
Eglinton		2				3								
Markham						1								
Mimico			1	12										
Roche's Point														
Swansea	4	3	1	1										
Toronto								4	3	63	dogs	2		
Weston														
	4	5	2	14		5		4	3	63		2		
Total														

of Health for month of August, 1912,—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
															1					
															4					
															7					
											1									
											13									
											14				21					
															9					
												1								
											6	27								
											9									
											15	28			145					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Creighton Mine						1								
Sault Ste. Marie					1	1								
Thessalon					1	3								
Victoria Mine							1							
					2	5	1							
Brant—														
Brantford									2	43	dog	1		
Burford					1									
St. George		1												
		1			1				2	43		1		
Bruce—														
Creemore				1				1						
Kincardine														
Kinlass						1								
Ripley						1								
				1		2		1						
Carlton—														
Ottawa					1	3	4	1						
					1	3	4	1						
Dufferin—														
Orangeville						1								
Shelburne								3						
						1		3						
Durham—														
Bethany								1						
Bowmanville								1						
Enniskillen						1								
Millbrook								1						
Pt. Hope														
						1		3						
Elgin—														
Aylmer						1								
Pt. Stanley							1							
Wallacetown						1								
						2	1							
Essex—														
Belle River											dog		1	
Comber				1										
Essex						1								
Kingsville							2	2						
Leamington						1					dog		1	
Walkerville														
Windsor					1	4	1	2						
				1	1	6	3	4					2	
Frontenac—														
Arden											dog		1	
													1	

of Health for month of September, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Grey—														
Dundalk	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Meaford	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Owen Sound	....	....	....	....	1	....	1	4	....	....	....	....	....	....
Rocklyn	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Shallow Lake	....	....	....	....	....	....	....	....	....	....	dog	....	1	....
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Halton—														
Oakville	....	1	....	....	....	....	....	1	....	....	....	....	....	....
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Haldimand—														
Dunnville	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jarvis	....	....	....	....	....	....	....	1	....	....	....	....	....	....
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Hastings—														
Madoc	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Marmora	....	....	....	....	....	1	....	....	....	....	....	....	....	....
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Huron—														
Clinton	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Dashwood	....	....	....	....	....	....	....	....	....	....	dog	1	....	....
Ethel	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Exeter	....	....	....	....	11	1	....	....	....	....	....	....	....	....
Fenwick	....	....	....	....	....	....	1	1	....	....	....	....	....	....
Zurich	....	....	....	....	....	....	1	1	....	....	....	....	....	....
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Kent—														
Chatham	....	....	....	....	1	2	....	2	....	....	....	....	....	....
Dresden	....	....	....	....	1	1	....	....	....	....	....	....	....	....
Wallaceburg	....	....	....	....	1	1	....	....	....	....	....	....	....	....
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Lambton—														
Alvinston	....	....	....	....	1	2	....	....	....	....	....	....	....	....
Chapleau	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oil Springs	....	....	....	....	2	....	....	....	....	....	....	....	....	....
Sarnia	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Wyoming	....	....	....	....	....	....	1	....	....	....	....	....	....	....
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Lincoln—														
Beamsville	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Niagara-on-the-Lake	....	....	....	....	....	1	....	2	....	....	....	....	....	....
St. Catharines	....	....	....	....	2	1	....	....	....	....	....	....	....	....
Vineland	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wellandport	....	....	....	1	....	....	....	....	....	....	....	....	....	....
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Middlesex—														
Ailsa Craig	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Granton	....	....	....	....	....	....	....	1	....	....	....	....	....	....
London	....	....	....	....	....	....	....	1	....	....	....	....	....	....

of Health for month of September, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	—	+	—	+	—	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Middlesex—Continued.														
Lucan					1									
					1	2		2						
Muskoka—														
Bracebridge				1										
				1										
Nipissing—														
Cobalt														
Cochrane				2	2									
Haileybury														
Jack Fish														
North Bay					1			2						
Sturgeon Falls				1										
Sudbury						1								
Verner						1								
				3	3	2		2						
Norfolk—														
Pt. Rowan						1		2						
Simcoe				1			1	3						
				1		1	1	5						
Northumberland—														
Castleton						1								
Cobourg						1		1						
						2		1						
Ontario—														
Pickering				1										
Saintfield							1							
Uxbridge						1								
				1		1	1							
Oxford—														
Ingersoll						4		2						
Princeton						1								
Tavistock						2								
Tillsonburg				1		1		1						
Woodstock					1		2	2						
				1	1	8	2	5						
Parry Sound—														
Depot Harbor														
South River						1								
						1								
Peel—														
Burnhamthorpe					1									
Mono Rd.				2										
				2	1									
Perth—														
Stratford					2			2						
					2			2						

of Health for month of September, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Peterboro—														
Havelock								1						
Peterboro						4		3						
						4		4						
Prescott—														
Vankleek Hill								1						
								1						
Rainy River—														
Ft. Frances				1										
				1										
Renfrew—														
Pembroke														
Russell—														
Bourget					2									
					2									
Simcoe—														
Barrie					1	2		2						
Bondhead						1								
Bradford						1								
Collingwood														
Fesserton														
Gilford											dog	1		
Midland						2								
Orillia				2				1						
				2	1	6		3				1		
Victoria—														
Lindsay					1			1						
					1			1						
Waterloo—														
Baden				1										
Berlin						1								
Galt						2								
Preston								1						
Waterloo			1		1									
			1	1	1	3		1						
Welland—														
Niagara Falls							1	3						
Ridgeway														
							1	3						
Wellington—														
Arthur				1										
Belwood				1				1						
Elora						2								
Erin			1	1										
Fergus						1								
Guelph								1						
Harriston								2						

of Health for month of September, 1912,—Continued,

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Wellington—Continued														
Moorefield														
			1	3		3		4						
York—														
Aurora					1	1								
Markham				1										
Mimico			4	18				1						
Schomberg								1						
Swansea	1	3		2										
Sutton West		1												
Richmond Hill						1								
Toronto		3				1		2	1	23	3dogs	1	2	
Weston						2								
	1	7	4	21	1	5		4	1	23		1	2	

Report from Laboratory of Provincial Board

Algoma—														
Gore Bay			1											
Sault Ste. Marie					1	1								
Thessalon						1								
Victoria Mines														
Webbwood														
			1		1	2								
Brant—														
Brantford					1									
Burford														
Paris														
					1				1	21				
Bruce—														
Chesley						2								
Kincardine														
Paisley						1								
Ripley						1								
Wiarton						2								
						6								
Carlton—														
Carp							1							
Kars					1									
Metcalfe														
Ottawa					2	2		1						
					3	2	1	1						
Dufferin—														
Orangeville						1								
Rosemont						1								
Shelburne														
						2								

of Health for month of September, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	—	Tubercle Bac. +	Tubercle Bac. —	Pus cells. +	Pus cells. —	Count.		Chemical.	Bacterial.									
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of Health for month of October, 1912.

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Report from Laboratory at Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Durham—														
Bethany					1	1								
Bowmanville							1							
Burketon Junction														
Clarke						1								
Newcastle								1						
Orono														
Port Hope														
					1	2	1	1						
Elgin—														
Aylmer						1								
Port Stanley					1									
Wallacetown					1	1								
					2	2								
Essex—														
Amherstburg														
Essex						1								
Kingsville					1	1								
Walkerville				2							dog	1		
Windsor					2	2								
				2	3	4						1		
Grey—														
Annan					1	1								
Chatsworth														
Dromore														
Markdale								1						
Meaford														
Owen Sound	3	8	1			1								
Hanover			1											
	3	8	2		1	2		1						
Grenville—														
Cardinal														
Prescott				1										
				1										
Halton—														
Georgetown								1						
Milton						1								
Palermo		2												
		2				1		1						
Haldimand—														
Caledonia														
Dunnville						1		1						
Selkirk							1	1						
						1	1	2						
Hastings—														
Bancroft														
Belleville														
Coe Hill				1		1								
Frankford	1	1												
Madoc					1									
Marmora					1									

of Health for month of October, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Hastings.—Continued														
Springbank					1									
	1	1		1	3	1								
Huron—														
Brucefield														
Exeter					1									
Gorrie														
Goderich						1								
Londesboro						2								
					1	3								
Kent—														
Chatham									2					
Dresden						1								
Merlin														
Wallaceburg														
						1			2					
Lambton—														
Camlachie														
Petrolia														
Sarnia									1					
									1					
Lanark—														
Lanark														
Pakenham														
Perth														
Lincoln—														
Beamsville						1								
Grimsby														
St. Catharines					4	2					dog		1	
Smithville				2		1								
Vineland														
				2	4	4							1	
Leeds—														
Lansdowne														
Mallorytown														
Lennox and Addington—														
Napanee														
Middlesex—														
Glencoe														
London														
Parkhill						1			1	21				
Strathroy														
						1			1	21				
Muskoka—														
Bracebridge									2					
Gravenhurst				1										

of Health for month of October, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Muskoka.—Continued														
Huntsville														
				1				2						
Nipissing—														
Charlton														
Cochrane						1								
Haileybury														
North Bay			1	2										
Sturgeon Falls					1			1						
Timmins														
			1	2	1	1		1						
Norfolk—														
Port Dover														
Port Rowan						1	1							
Simcoe							2							
						1	3							
Northumberland—														
Cobourg														
Colborne														
Bailieboro														
Ontario—														
Cannington														
Newmarket														
Port Perry				2										
Oshawa						1								
Uxbridge														
Sainffield				1										
				3		1								
Oxford—														
Drumbo														
Ingersoll						2		1						
Thamesford														
Tillsonburg				1	1	2	1	4						
Plattsville					1	1								
Woodstock								2						
				1	2	5	1	7						
Parry Sound—														
Burk's Falls				2										
Byng Inlet						1								
Parry Sound														
South River						2								
Sprucedale														
Powassan						1								
Sundridge														
				2		4								
Peel—														
Burnhamthorpe						1								
Streetsville														
						1								

of Health for month of October, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Perth—														
Atwood														
Listowel								1						
Monkton				1			2	1						
Millbank														
Sebringville														
Strattord						1		1						
				1		1	2	3						
Peterboro'—														
Hastings				1										
Norwood					1									
Peterboro'					2									
				1	3									
Prince Edward—														
Bloomfield														
Picton														
Prescott—														
Fournier														
L'Orignal														
Vankleek Hill						1								
						1								
Rainy River—														
Keewatin						1								
Kenora														
						1								
Renfrew—														
Douglas														
Pembroke														
Renfrew			1											
			1											
Simcoe—														
Barrie					1	2		4						
Collingwood						1								
Duntroon														
Midland						2								
Thornton								1						
Victoria Harbor				1										
Phelpston						1								
				1	1	6		5						
Stormont—														
Mille Roches														
Osnabruck Centre														
Thunder Bay—														
Nepigon					1						dog		1	
					1								1	

of Health for month of October, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Victoria—														
Bobcaygeon						1								
Lindsay					1	2								
Little Britain				1										
Manilla														
				1		3								
Waterloo—														
Ayr							1	2						
Berlin						3		2						
Galt				1			1							
Hawkesville						1								
Hespeler		1												
Linwood														
Waterloo				3		3								
		1		3		7	2	4						
Welland—														
Fonthill						1								
Niagara Falls					1	1	2							
Port Colborne					1	1								
Ridgeway														
Thorold					1									
					3	3	2							
Wellington—														
Drayton						1	2	1						
Belwood			1	1		1								
Elora						2								
Harriston					1									
Hillsburg						1								
Guelph							1	1						
Moorefield						1								
Mount Forest														
			1	1	1	6	3	2						
Wentworth—														
Binbrook				2										
Freelton														
Hamilton														
Sheffield						1								
				2		1								
York—														
Agincourt														
Aurora														
Mimico		1	4	24	2									
Markham								1						
Schomberg				1										
Swansea		2	3	1										
Toronto				2		2		2			dog		1	
Weston						2								
Wychwood														
		3	7	28	2	4		3					1	

of Health for month of October, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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4	...	...	4	...	....	....	....	4	....	....	8	....	....	....	34	5	12	15	12	44
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Algoma—														
Chelmsford														
Little Current					2									
Manitowaning					1									
Sault Ste. Marie						1								
Thessalon						2								
Victoria Mine				1		1								
				1	3	4								
Brant—														
Brantford					2	4								
Burford					1									
					3	4								
Bruce—														
Chesley				1	3									
Paisley						1								
Ripley						1								
Teeswater														
Walkerton														
				1	3	2								
Carleton—														
Carp														
Metcalf				2										
North Gower														
Ottawa						1	1							
				2		1	1							
Dufferin—														
Grand Valley						1	1	1						
Honeywood						1								
Marshville						1								
Orangeville					1									
					1	3	1	1						
Durham—														
Bowmanville				1										
Newcastle														
Port Hope														
				1										
Essex—														
Belle River				1										
Kingsville														
S. Woodslee														
Windsor						6								
				1		6								
Elgin—														
Port Burwell								2						
Port Stanley							1							
Straffordville														
Union									3	63	cow	1		
							1	2	3	63		1		

of Health for month of November, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Frontenac—														
Kingston														
Glengarry—														
Apple Hill														
Dunvegan														
Lancaster														
Maxville														
Martintown														
Grenville—														
Bishop's Mills														
Prescott				4										
Grey—				4										
Annan						1								
Chatsworth														
Dundalk					1	1								
Durham						1								
Hanover														
Meaford		1		3		1								
Neustadt														
Owen Sound						1								
Shallow Lake						1								
Halton—		1		3	1	6								
Oakville														
Palermo		1												
Hastings—		1												
Madoc					1									
Marmora					1	1								
Maynooth				1										
Huron—				1	2	1								
Auborn						1								
Brussels							1							
Clinton							1							
Exeter						1								
Fordwich						1								
Goderich						1		1						
Landesboro						1								
Seaforth							2							
Wingham						1								
Kent—						6	4	1						
Blenheim								4			cat		1	
Chatham				1			2							
Merlin														
Wallaceburg						1								
				1		1	2	4					1	

of Health for month of November, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.							Water.	Diphtheria.	T.B.	Typhoid.	Total.
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.		Chemical.	Bacterial.									
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Lambton—														
Alvinston				1										
Arkona						2								
Sarnia														1
Thedford					1									
Wyoming								2						
				1	1	2		2						1
Lanark—														
Perth				1										
				1										
Leeds—														
Brockville														
Seeley's Bay														
Lincoln—														
Ottercliff Sta.				1										
Beamsville			3	1										
Caistorville					1									
Jordon			2											
St. Catharines				1	1	2	1	2						
			5	3	2	2	1	2						
Lennox and Addington.														
Odessa														
Middlesex—														
Ailsa Craig						1								
Lambeth														
London														
						1								
Muskoka—														
Bracebridge						2		1						
Gravenhurst			1	1										
			1	1		2		1						
Nipissing—														
Charlton					1									
Cobalt														
Cochrane														
Haileybury														
New Liskeard						1								
North Bay														
Sturgeon Falls						1								
Swastika														
					1	2								
Norfolk—														
Delhi														
Port Dover						1								
Port Rowan								1						
Simcoe							1	3						
						1	1	4						

of Health for month of November, 1912,—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Northumberland—														
Bomanton														
Cobourg							1							
Colborne			1		1									
Grafton														
Wooler					1									
			1		2		1							
Ontario—														
Beaverton						1								
Uxbridge						1								
Whitby						2								
Zephyr														
						4								
Oxford—														
Bright														
Drumbo														
Embro									1	4	horse	1		
Ingersoll				1	2	2	1							
Plattsville								1						
Thamesford														
Tillsonburg				2										
Woodstock						1								
				3	2	3	1	1	1	4		1		
Parry Sound—														
Burk's Falls				1										
Byng Inlet				1		1								
Callender														
Dunchurch														
Kearney		2	2											
Loring														
Parry Sound														
Powassan						1								
South River														
Sprucedale														
		2	2	2		2								
Peel—														
Alton		1		2										
Brampton														
Mono Rd.														
Streetsville				1										
		1		3										
Perth—														
Hastings						1								
Listowel						1								
Milverton								1						
St. Mary's			1											
Sebringville														
Shakespeare														
Stratford							1							
			1			2	1	1						

of Health for month of November, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Peterboro'—														
Lakefield														
Peterboro'					1	1								
					1	1								
Prescott—														
Riceville		2	1											
St. Amour						1		1						
Vankleek Hill							1							
		2	1			1	1	1						
Prince Edward—														
Bloomfield					1									
Picton		1	2			1								
		1	2		1	1								
Rainy River—														
Rainy River						2								
						2								
Renfrew—														
Cobden														
Eganville					1									
Pembroke						1								
					1	1								
Russell—														
Bourget														
Simcoe—														
Alliston								1						
Angus														
Barrie			1		1	1		1						
Beeton								1						
Bondhead						1								
Bradford														
Collingwood			2	2		1		1						
Coldwater														
Edgar														
Everett						1								
Hillsdale							1							
Orillia						1		1						
Midland						1								
Stayner														
Stroud														
			3	2	1	6	1	5						
Thunder Bay—														
Fort William							1							
Port Arthur								1						
Schreiber						1								
						1	1	1						
Victoria—														
Lindsay														

of Health for month of November, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report of Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuberculous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Victoria.—continued.														
Little Britain						1								
						1								
Waterloo—														
Ayr								2						
Berlin						3	1							
Elmira														
Galt				1										
Hespeler					1									
New Dundee							1							
New Hamburg						1								
Preston						1								
Waterloo			1	1		1								
			1	2	1	6	2	2						
Welland—														
Niagara Falls					2									
Pt. Colborne						1								
Ridgeway														
Welland							1							
					2	1	1							
Wellington—														
Alma														
Arthur														
Elora						1								
Fergus					1									
Guelph					1									
Harriston														
Moorefield														
Mt. Forest						1								
Rockwood														
					2	2								
Wentworth—														
Hamilton														
York—														
Agincourt								2						
Aurora					1	4								
Eglinton			1	1	1	1								
Hagerman's Cor.											dog	1		
Lloydtown														
Mimico			1	17	2	1								
Mt. Albert														
Richmond Hill					1									
Schomberg														
Swansea		4	1	1										
Thornhill						1								
Toronto				3		2			1	20	dog	1	1	
Unionville														
Weston			1	2										
		4	4	24	5	9		2	1	20		2	1	

of Health for month of November, 1912.—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis									Negri bodies		
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	+	−	Animal inoculations
Algoma—														
Blind River														
Sault Ste. Marie	3	21	4	30		2		1						
Victoria Harbor						1								
	3	21	4	30		3		1						
Brant—														
Brantford						3								
Burford						1								
						4								
Bruce—														
Chesley								3						
Hepworth														
Kincardine				1										
Lion's Head						2								
Paisley						1								
Teeswater														
Tara				1	1									
Wiarton				1										
				3	1	3		3						
Carleton—														
Carp					1	2								
Metcalfe						3								
Ottawa						1								
					1	6								
Dufferin—														
Grand Valley					1	2		1						
Orangeville						2								
Shelburne						1								
					1	5		1						
Durham—														
Bethany						1								
Bowmanville						2								
Enniskillen						1								
Orono														
Millbrook						1	1	1						
Tyrone											dog	1		
						5	1	1				1		
Elgin—														
Port Stanley								2						
St. Thomas									1	21				
								2	1	21				
Essex—														
Comber				1										
Essex						1								
Kingsville				1		1								
Walkerville				1										
				3		2								
Glengarry—														
Alexandria														

of Health for month of December, 1912.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
Fats.	Total Solids.	+	−	Tubercle Bac. +	Tubercle Bac. −	Pus cells. +	Pus cells. −	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Grenville—														
Bishop's Mills														
Kemptville						1								
Prescott		1												
		1				1								
Grey—														
Annan						1								
Dundalk						1								
Durham		1		1		1								
Markdale						1								
Rocklyn			1											
Owen Sound					3	2		1						
		1	1	1	3	6		1						
Haldimand—														
Caledonia						1								
Cayuga						1								
						2								
Halton—														
Campbellville				1										
Georgetown					1	2		1						
				1	1	2		1						
Hastings—														
Madoc						1								
Marmora				1		2	1	1						
Maynooth						3								
Trenton			1	1										
			1	2		6	1	1						
Huron—														
Belgrave					1									
Brussels								2						
Hensall								1						
Seaforth				1			1							
Zephyr						1		1						
				1	1	1	1	4						
Kent—														
Blenheim					1									
Chatham					2	4		2						
Merlin						1								
Thamesville						1								
Tilbury														
Wallaceburg						1								
					3	7		2						
Lambton—														
Alvinston						1								
Petrolia				1										
Sarnia														
Wilkesport														
				1		1								

of Health for month of December, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	10	12	34
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Lanark—														
Almonte						1								
Pakenham					1									
Perth				3										
				3	1	1								
Leeds—														
Brockville					1	1								
					1	1								
Lincoln—														
Beamsville						1								
Niagara-on-the-Lake						1								
St. Catharines					1	5		2						
Smithville														
					1	7		2						
Middlesex—														
Lambeth				1										
London														
				1										
Muskoka—														
Gravenhurst				3				1						
Huntsville				1										
Rosseau														
				4				1						
Nipissing—														
Bonfield														
Haileybury						1								
New Liskeard						2								
Porcupine														
Port McNichol			1											
Sturgeon Falls								1						
Verner					1									
			1		1	3		1						
Norfolk—														
Langton					1									
Port Rowan								1						
Simcoe								2						
Waterford						1								
					1	1		3						
Northumberland—														
Campbellford	4	10												
Colborne						3								
Cobourg								1						
Grafton														
	4	10				3		1						
Ontario—														
Beaverton								1						
Port Perry				2										
Sunderland														
Whitby			1			1								
			1	2		1		1						

of Health for month of December, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
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Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Oxford—														
Ingersoll				1				1	2	44	dog		1	
Plattsville								1						
Tillsonburg								2						
Woodstock						2		5						
				1		2		9	2	44			1	
Parry Sound—														
Byng Inlet														
Loring						1								
Parry Sound				1										
Powassan						1								
Sprucedale														
				1		2								
Peel—														
Brampton				2										
Streetsville				2										
				4										
Peterboro—														
Peterboro				1										
				1										
Prince Edward—														
Picton				3		2								
				3		2								
Perth—														
Kirkton					1									
Listowel						1								
Monkton					1	2								
St. Mary's								1						
Stratford		1		1		1	1							
Shakespeare				1										
		1		2	2	4	1	1						
Prescott—														
Fournier	1													
St. Isadore de Prescott					1									
	1				1									
Rainy River—														
Ft. Frances														
Rainy River						1								
						1								
Renfrew—														
Eganville				1	1									
Pembroke						1								
Renfrew				2	3	1								
				3	4	2								
Russell—														
Rockland														

of Health for month of December, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
											1									
											1				60					
																24				24
																1				1
															3	25				25
																	6	5	6	17
															4		6	5	6	17
											2									
											2				2					
															5					
															11					
															2					
																	12	10	12	34
																	6	5	6	17
															1		18	15	18	51
															9					
											1									
											1				1					

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
Simcoe—														
Barrie						1	3	13						
Beeton														
Collingwood				2										
Cookstown					11									
Everett						1								
Creemore														
Orillia								4						
Phelpston				1										
Stayner				2										
Victoria Harbor				1										
Thornton					1									
Hillsdale						1		1						
				6	12	3	3	18						
Thunder Bay—														
Nipigon											2dogs	1	1	
Port Arthur														
												1	1	
Victoria—														
Fenelon Falls						1		1						
Lindsay					1									
					1	1		1						
Waterloo—														
Berlin	2		1		1	5		1						
Elmira						1								
Galt					1	2								
New Hamburg							1	2						
Waterloo			2		1									
	2		3		3	8	1	3						
Wentworth—														
Burlington														
Sheffield						1		1						
Waterdown				1										
				1		1		1						
Wellington—														
Arthur						1								
Drayton						1		1						
Elora						1								
Belwood						1								
Clifford														
Glen Allan														
Guelph														
Harriston						1								
Morriston				3										
Mount View														
Rockwood														
				3		5		1						

of Health for month of December, 1912.—Continued.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.																
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.	Extraneous matter.	Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	6	17
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	6	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	44	...	12	10	12	36
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	26	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	5	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	6	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	6	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	12	10	12	34

Report from Laboratory of Provincial Board

Municipalities	Diphtheritic swabs				Tuber-culous sputa		Typhoid bloods		Pasteur preventive treatment		Rabies diagnosis			
	Release		Diagnosis											
	+	−	+	−	+	−	+	−	Cases	Number of injections	Animal	Negri bodies +	Negri bodies −	Animal inoculations
York—														
Aurora	....	....	....	....	....	2	....	....	....	....	....	....	....	....
Cedar Grove	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Markham	....	....	....	....	1	....	....	1	....	....	....	....	....	....
Mimico	....	1	4	18	....	1	....	....	....	....	....	....	....	....
Mount Albert	....	....	....	2	....	1	....	....	....	....	....	....	....	....
Swansea	....	....	....	2	....	....	....	....	....	....	....	....	....	....
Toronto	....	1	....	1	1	1	....	2	11	246	2 dogs	....	2	....
Unionville	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Woodbridge	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Weston	....	....	....	5	1	1	....	1	....	....	1 dog	1	....	....
	....	2	4	28	3	6	....	4	11	246	3	1	2	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....

of Health for month of December, 1912,—Concluded.

Milk										Waters.		Liquors for License Dept.	Doses of Typhoid Vaccine sent out.	Miscellaneous Specimens.	Total for month.	Outfits sent out.				
Food Content.		Preservatives.		Bacteriological.					Extraneous matter.											
				Tubercle Bac.		Pus cells.														
Fats.	Total Solids.	+	−	+	−	+	−	Count.		Chemical.	Bacterial.					Water.	Diphtheria.	T.B.	Typhoid.	Total.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	10	12	22
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	...	...	12
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	51	...	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	6	17
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	18	15	18	54
...	...	...	...	...	...	...	...	...	...	...	5	51	...	1	367	6	48	40	48	142
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

REPORT FROM LABORATORY OF PROVINCIAL BOARD OF HEALTH AT KINGSTON FOR MONTHS OF JANUARY, FEBRUARY, MARCH, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+		+	−	+	−				
Bruce				1								1
Carleton				1		4	7	6				18
Dundas				1		7		1			1	10
Frontenac	1	11	3	30	15	55	23	55	12		28	233
Glengarry			2	4		2		1				9
Grenville						5	4	6	1		3	19
Hastings				8	3	10		3	8		4	36
Lanark	1		3	2	2	4	3	4	1		3	23
Leeds			1	6	1	10	2	4			13	37
Lennox and Addington				2	2	6	1	4	1		2	18
Nipissing						1			1			2
Northumberland						1	1		2			4
Prescott					1	1		1				3
Prince Edward						1						1
Renfrew			1	1	4	10	2	2			1	21
Russell		1	2	3		5		2				13
Simcoe						2	3	4				9
Stormont				2			1				1	4
Victoria						2						2
Waterloo						1						1
Welland					1							1
	2	12	12	61	29	127	47	93	26		56	465

Report from Laboratory of Provincial Board of Health, Kingston, for Months of January, February, March, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	-	+	-	+	-	+	-				
Bruce—												
Paisley				1								1
Carleton—												
Crysler						1						1
Ottawa						2	6	4				12
Richmond								2				2
Vernon				1		1	1					3
Dundas—												
Brinston						1						1
Chesterville						1						1
Morrisburg						2						2
Winchester				1		3		1			1	6
Frontenac—												
Barriefield											10	10
Flinton								1				1
Harrowsmith						1		1				2
Kingston	1	11	3	30	14	50	20	50	9		16	204
Mountain Grove									1			1
Portsmouth					1	2			2			5
Sharbot Lake						1						1
Sydenham						1					1	2
Verona							3	2			1	6
Wolfe Island								1				1
Glengarry—												
Apple Hill						1						1
Lancaster				2								2
Maxville						1		1				2
Williamstown			2	2								4
Grenville—												
Bishop's Mills								3				3
Cardinal											1	1
Kemptville						2						2
Prescott						1	4	3	1		2	11
Spencerville						2						2
Hastings—												
Bancroft					1	4		1				6
Belleville				5	1				7		1	14
Madoc				2								2
Roslin				1	1	3		2			3	10
Trenton						1			1			2
Tweed						2						2
Lanark—												
Almonte	1		2	1	1				1			6
McDonald's Corners						1		1			3	5
Perth			1									1
Smith's Falls				1	1	3	3	3				11
Leeds—												
Brockville						4	2				12	18
Delta				1								1
Elgin						1						1

Report from Laboratory of Provincial Board of Health, Kingston, for months of January, February, March, 1912.—*Con.*

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Leeds.—Con.												
Gananoque						1		2				3
Lansdowne					1	4		1				6
Lyn											1	1
Mallorytown			1	4								5
Seeley's Bay				1								1
Toledo								1				1
Lennox & Addington—												
Bath				1		1						2
Enterprise					1							1
Napanee				1	1	4		1	1		2	10
Stella								1				1
Tamworth						1	1	1				3
Yarker								1				1
Nipissing—												
Sudbury						1			1			2
Northumberland—												
Campbellford									1			1
Port Hope						1	1		1			3
Prescott—												
Fournier								1				1
St. Amour					1	1						2
Prince Edward—												
Picton						1						1
Renfrew—												
Calabogie						1						1
Cobden						3	2	2			1	8
Douglas						1						1
Pembroke			1	1	2	4						8
Renfrew					2	1						3
Russell—												
Cumberland			1			1						2
Metcalfe		1	1	3		4		2				11
Simcoe—												
Barrie						2	3	4				9
Stormont—												
Avonmore				2							1	3
Finch							1					1
Victoria—												
Lindsay						2						2
Waterloo—												
Preston						1						1
Welland—												
Niagara Falls S.					1							1
Totals	2	12	12	61	29	127	47	93	26		56	465

REPORT FROM LABORATORY OF PROVINCIAL BOARD OF HEALTH AT KINGSTON FOR MONTHS OF APRIL, MAY, JUNE, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	-	+	-	+	-	+	-				
Bruce	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Carleton	.....	.....	.....	.....	2	7	1	3	.....	.....	.....	13
Dundas	.....	.....	.....	.....	.....	7	2	2	.....	.....	.....	11
Essex	.....	.....	.....	.....	1	2	.....	.....	.....	.....	.....	3
Frontenac	8	21	10	28	20	62	13	55	27	.....	18	262
Glengarry	.....	.....	.....	1	1	4	.....	.....	.....	.....	.....	6
Grenville	.....	.....	.....	.....	3	7	5	1	1	.....	2	19
Haldimand	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Hastings	.....	.....	.....	.....	6	7	1	5	2	.....	1	22
Lanark	.....	.....	1	1	2	5	1	2	1	.....	6	19
Lennox & Addington.	.....	4	3	6	4	6	4	12	.....	.....	4	43
Leeds	.....	.....	.....	6	6	16	7	16	.....	.....	13	64
Nipissing	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Northumberland	.....	.....	.....	.....	3	2	.....	5	1	.....	.....	11
Peterboro'	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Prescott	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Prince Edward	.....	.....	.....	.....	.....	3	.....	1	.....	.....	.....	4
Renfrew	.....	.....	1	2	3	16	1	4	.....	.....	5	32
Russell	.....	.....	.....	2	.....	.....	.....	2	.....	.....	.....	4
Simcoe	.....	.....	.....	.....	.....	5	1	6	.....	.....	.....	12
Stormont	.....	.....	.....	1	2	3	1	2	.....	.....	.....	9
Victoria	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	2
Waterloo	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	2
Welland	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Wentworth	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
York	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
	8	25	15	47	58	156	37	118	32	.....	53	549

Report from Laboratory of Provincial Board of Health at Kingston for months of April, May, June, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Bruce—												
Paisley						1		1				2
Carleton—												
Crysler						1						1
Manotick					1	2						3
Ottawa					1	3	1	2				7
Richmond						1		1				2
Dundas—												
Chesterville—						2						2
Morrisburg							1	2				3
Winchester						5	1					6
Essex—												
Essex					1	2						3
Frontenac—												
Barriefield											4	4
Flinton								1				1
Harrowsmith							1	1				2
Kingston	8	21	10	27	20	59	12	48	24		11	240
Parham								1				1
Portsmouth				1					3		3	7
Verona						2		3				5
Wolfe Island						1		1				2
Glengarry—												
Alexandria						2						2
Dalkeith						1						1
Maxville				1	1							2
Williamstown						1						1
Grenville—												
Kemptville					2	4						6
Prescott					1		5	1			2	9
Spencerville						3			1			4
Haldimand—												
Hagersville											2	2
Hastings—												
Bancroft					1		1					2
Belleville									1			1
Hastings					1	1		1				3
Madoc					1	1		2				4
Marlbank					1	1		1				3
Roslin								1	1			2
Shannonville						1						1
Trenton					1							1
Tweed					1	3					1	5
Lanark—												
Almonte				1	1	2		1				5
Lanark						1						1
McDonald's Corners						1						1
Perth			1								6	7
Smith's Falls					1	1	1	1	1			5
Leeds—												
Brockville					3	6	5	8			11	33
Chaffey's Locks											2	2
Delta						2						2
Elgin						2						2
Gananoque					2		1	1				4
Lansdowne				4		4	1	7				16
Lyn					1	1						2

Report from Laboratory of Provincial Board of Health at Kingston for months of April, May, June, 1912.—*Continued.*

Municipalities.	Diphtheritic Swabs.				Tubercu-lous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Leeds—Con.												
Mallorytown	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	2
Newboro'	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Lennox & Addington—												
Bath	.....	4	3	1	.....	.....	.....	.....	.....	.....	.....	8
Deseronto	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Enterprise	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2
Napanee	.....	.....	.....	1	1	2	2	5	.....	.....	4	15
Newburgh	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	2
Odessa	.....	.....	.....	1	.....	.....	1	2	.....	.....	.....	4
Tamworth	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Yarker	.....	.....	.....	2	2	1	1	3	.....	.....	.....	9
Nipissing—												
Cochrane	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Northumberland—												
Castleton	.....	.....	.....	.....	1	.....	.....	3	.....	.....	.....	4
Port Hope	.....	.....	.....	.....	2	2	.....	2	1	.....	.....	7
Peterboro'—												
Peterboro'	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Prescott—												
Fournier	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Prince Edward—												
Picton	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2
Wellington	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	2
Renfrew—												
Arnprior	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	4	5
Cobden	.....	.....	.....	.....	.....	4	.....	2	.....	.....	1	7
Douglas	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	2
Forresters' Falls	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Killaloe	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Pembroke	.....	.....	1	.....	.....	6	.....	.....	.....	.....	.....	7
Renfrew	.....	.....	.....	.....	3	4	1	1	.....	.....	.....	9
Russell—												
Metcalfe	.....	.....	.....	2	.....	.....	.....	2	.....	.....	.....	4
Simcoe—												
Barrie	.....	.....	.....	.....	.....	4	1	6	.....	.....	.....	11
Port McNicoll	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Stormont—												
Avonmore	.....	.....	.....	1	1	2	.....	.....	.....	.....	.....	4
Cornwall	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2
Finch	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2
Newington	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Victoria—												
Lindsay	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	2
Waterloo—												
Preston	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	2
Welland—												
Niagara Falls S	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Wentworth—												
Ancaster	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
York—												
Toronto	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Totals	8	25	15	47	58	156	37	118	32	.....	53	549

REPORT FROM LABORATORY OF PROVINCIAL BOARD OF HEALTH AT KINGSTON FOR MONTHS OF JULY, AUGUST, SEPTEMBER, 1912.

Municipalities.	Diphtheritic Swabs.				Tubercu-lous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Algoma				1								1
Bruce						2						2
Carleton					5	8	50	29			3	95
Dundas						1	2	1			7	11
Durham					1	1						2
Frontenac	7	26	11	39	12	57	29	75	44		34	334
Glengarry					1	1	2	1				5
Grenville			1		7		2	2	1		1	14
Haldimand											1	1
Hastings			1	1		7	3	7			2	21
Lanark	2		6	1	2	4	3	4				22
Leeds			3	4	7	15	11	23	1		32	96
Lennox & Addington.			1		1	7	4	6			7	26
Nipissing						2						2
Northumberland						1	1	5	1			8
Peterboro'						1			1		4	6
Prescott					1	1	1				6	9
Prince Edward					1	1					2	4
Renfrew		4	4	6	8	14	2		1		4	43
Russell						3	2	3			8	16
Simcoe							3	6	1			10
Stormont					1	4	1	2	1		4	13
Victoria					1							1
Welland					1							1
Wentworth					1	1						2
Waterloo						2						2
Totals	9	30	27	52	50	133	116	164	51		115	747

Report from Laboratory of Provincial Board of Health at Kingston, for months of July, August, September, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Algoma—												
Massey Station				1								1
Bruce—												
Paisley						2						2
Carleton—												
Manotick						1	1					2
North Gower					1		1	2			3	7
Ottawa					4	7	46	26				83
Richmond							2					2
Vernon								1				1
Dundas..												
Chesterville											4	4
Winchester						1	2	1			3	7
Durham—												
Orono					1	1						2
Frontenac—												
Barriefield									1		8	9
Harrowsmith								2				2
Kingston	7	26	11	39	12	56	27	65	36		23	302
Portsmouth								3	7			10
Sharbot Lake											1	1
Sydenham						1						1
Verona							2	4			2	8
Wolfe Island								1				1
Glengarry—												
Maxville						1	2	1				4
Williamstown					1							1
Grenville—												
Kemptville					5		1				1	7
Prescott			1				1	2				4
Spencerville					2				1			3
Haldimand—												
Hagersville											1	1
Hastings—												
Bancroft						1		2				3
Belleville			1	1								2
Hastings							1	1				2
Marlbank						1	1	2				4
Roslin						1						1
Stirling								1			2	3
Shannonville						2	1	1				4
Trenton						2						2
Lanark—												
Almonte						1						1
Perth	2		3	1								6
Smith's Falls			3		2	3	3	4				15
Leeds—												
Athens						1					1	2
Brockville					3	8	5	10			24	50
Chaffey's Locks											4	4
Delta			1				1		1			3
Gananoque					2	3	1	7				13
Lansdowne			1	2	1	2	3	4				13
Lyn								1			2	3
Mallorytown			1	2		1	1	1				6
Seeley's Bay											1	1
Westport					1							1

Report from Laboratory of Provincial Board of Health at Kingston, for months of July, August September, 1912.

Municipalities.	Diphtheritic Swabs.				Tubercu-lous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Lennox & Addington—												
Bath						1						1
Enterprise						1		3				4
Napanee					1	4	2	1			1	9
Newburg						1						1
Odessa							1	1			1	3
Stella			1				1				4	6
Tamworth											1	1
Yarker								1				1
Northumberland—												
Campbellford								1				1
Castleton								3	1			4
Port Hope						1	1	1				3
Nipissing—												
Cochrane						2						2
Prescott—												
Fournier							1				2	3
St. Armour					1	1						2
Vankleek Hill											4	4
Peterboro'—												
Lakefield						1						1
Peterboro'									1		3	4
Warsaw											1	1
Prince Edward—												
Picton					1	1					2	4
Renfrew—												
Arnprior											3	3
Cobden						1	2				1	4
Douglas				1								1
Pembroke					4	3			1			8
Renfrew		4	4	4	4	10						26
Westmeath				1								1
Russell—												
Metcalfe						3	2	3			8	16
Simcoe—												
Barrie							3	6	1			10
Stormont—												
Avonmore					1				1			2
Cornwall								1				1
Finch						4					4	8
Newington							1	1				2
Victoria—												
Lindsay					1							1
Welland—												
Niagara Falls S.					1							1
Wentworth—												
Ancaster						1						1
Lynden					1							1
Waterloo—												
Preston						2						2
Totals	9	30	27	52	50	133	116	164	51		115	747

REPORT FROM LABORATORY OF PROVINCIAL BOARD OF HEALTH AT KINGSTON FOR MONTHS OF OCTOBER, NOVEMBER, DECEMBER, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	-	+	-	+	-	+	-				
Algoma	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2
Bruce	.....	.....	.....	.....	.....	1	.....	3	.....	.....	.....	4
Carleton	.....	.....	.....	.....	2	6	6	16	.....	.....	.....	30
Dundas	.....	.....	.....	.....	.....	2	2	.....	.....	.....	2	6
Essex	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2
Frontenac	13	35	8	45	20	54	15	52	34	.....	190	466
Glengarry	.....	.....	.....	.....	.....	4	1	.....	.....	.....	.....	5
Grenville	1	3	4	11	1	2	1	2	.....	.....	.....	25
Hastings	.....	.....	4	2	1	8	.....	7	.....	.....	.....	22
Kent	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Lanark	.....	.....	3	12	5	5	1	7	.....	.....	.....	33
Leeds	.....	.....	.....	1	2	20	9	10	1	.....	6	49
Lennox & Addington.	.....	.....	1	2	2	11	4	4	.....	.....	3	27
Northumberland	1	2	.....	1	.....	3	3	3	.....	.....	.....	13
Peterboro'	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	2
Prescott	2	2	1	.....	1	.....	.....	.....	.....	.....	.....	6
Prince Edward	.....	.....	.....	.....	1	4	.....	.....	.....	.....	1	6
Renfrew	1	2	7	9	5	5	1	1	.....	.....	8	39
Russell	.....	1	1	1	.....	3	.....	3	.....	.....	.....	9
Simcoe	.....	.....	.....	.....	.....	1	7	7	.....	.....	.....	15
Stormont	.....	.....	.....	.....	1	4	.....	1	.....	.....	.....	6
Waterloo	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2
Totals	18	45	29	84	41	137	52	119	35	.....	210	770

Report from Laboratory of Provincial Board of Health at Kingston for Months of October, November, December, 1912.

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Algoma—												
Massey								2				2
Bruce—												
Paisley						1		3				4
Carleton—												
North Gower						1						1
Ottawa					2	5	6	14				27
Richmond								2				2
Dundas—												
Chesterville						1						1
Morrisburg						1	1					2
Winchester							1				2	3
Essex—												
Essex						1	1					2
Frontenac —												
Barriefield											33	33
Flinton						1		1				2
Harrowsmith				1		1	1	2				5
Kingston	13	35	8	44	16	50	11	41	27		154	399
Portsmouth					3	2		5	7		2	19
Sydenham					1							1
Verona							3	2			1	6
Wolfe Island								1				1
Glengarry—												
Alexandria						1						1
Dalhousie Mill						1						1
Lancaster						1						1
Maxville							1					1
Williamstown						1						1
Grenville												
Jasper								1				1
Prescott	1	2	3	11	1		1	1				20
Spencerville		1	1			2						4
Hastings—												
Bancroft						2						2
Belleville			3	2		1		1				7
Marlbank						2		2				4
Roslin					1	1		2				4
Stirling								1				1
Shannonville			1					1				2
Tweed						2						2
Kent—												
Blenheim						1						1
Lanark—												
Almonte					1							1
Perth			2	5	1	1						9
Smith's Falls			1	7	3	4	1	7				23

Report from Laboratory of Provincial Board of Health at Kingston for Months of October, November, December, 1912.—*Continued.*

Municipalities.	Diphtheritic Swabs.				Tuberculous Sputa.		Typhoid Bloods.		Miscellaneous Specimens.	Waters.		Total Number for Quarter.
	Release.		Diagnosis.							Chemical.	Bacterial.	
	+	−	+	−	+	−	+	−				
Leeds—												
Brockville					1	6	5	6			6	24
Delta						1						1
Gananoque						5	1		1			7
Lansdowne				1		6	1	2				10
Lyn						1						1
Mallorytown					1		2	1				4
Newboro'								1				1
Seeley's Bay						1						1
Lennox & Addington												
Bath			1				1					2
Enterprise					1	4		1				6
Napanee				2		5	2	2			1	12
Newburgh					1							1
Tamworth						2						2
Yarker							1	1			2	4
Northumberland—												
Campbellford	1	2				1		2				6
Janetsville						1						1
Port Hope						1	2	1				4
Roseneath				1			1					2
Peterboro'—												
Peterboro'							1	1				2
Prescott—												
Fournier	2	2	1		1							6
Prince Edward—												
Picton					1	2						3
Wellington						2					1	3
Redfrew—												
Arnprior			1	2							7	10
Cobden				1		1	1	1			1	5
Douglas						1						1
Pembroke					1	1						2
Renfrew	1	2	6	6	4	2						21
Russell—												
Metcalfe		1	1	1		3		3				9
Simcoe—												
Barrie						1	7	7				15
Stormont—												
Cornwall						1						1
Finch					1	2						3
Newington						1		1				2
Waterloo—												
Preston						2						2
Totals	18	45	29	84	41	137	52	119	35		210	770

Provincial Board of Health of Ontario Experimental Station

BULLETIN No. 1

Factors in the Design, Regulation and Action of Slow Sand Filters

BY

F. A. DALLYN, B.A.Sc., C.E. (Tor.)

Provincial Sanitary Engineer

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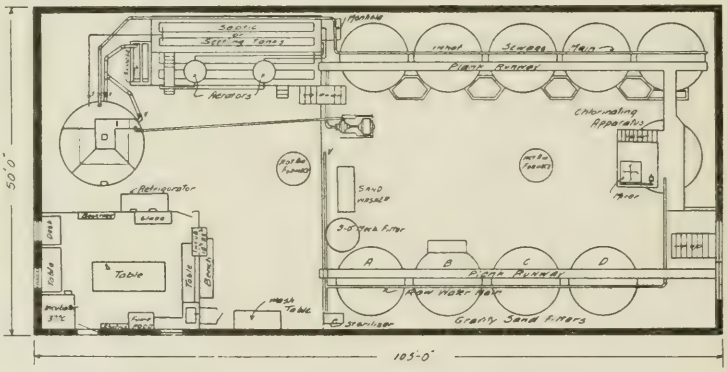
PROVINCIAL BOARD OF HEALTH OF ONTARIO
EXPERIMENTAL STATION
LAYOUT
1912



J. A. Dallyn
ENGR. IN CHARGE

FACTORS IN THE DESIGN, REGULATION AND ACTION OF SLOW SAND FILTERS.

(Does a properly operated filter give absolute safety to a water supply?)

TORONTO, April 1st, 1913.

GENTLEMEN,—I have the honour to transmit herewith Bulletin No. 1 of the Experimental Station, which gives the results of investigations relating to the design, regulation, and action of slow sand filters.

Your obedient servant,

FREDERICK ALFRED DALLYN,

Engineer in Charge of Experimental Station,

Chairman, Members,
Provincial Board of Health, Ont.

INTRODUCTION.

At this present time of stock-taking in public health measures it is proper that certain facts in connection with the protection of our water supplies, more particularly those facts relating to slow sand filtration, be presented, and that certain principles involved therein be elaborated.

In connection with slow sand filtration there exists reliable data from which to draw certain conclusions. We know that slow sand filters protect a water supply to a remarkable extent from epidemics of water-borne infectious diseases such as cholera, typhoid, dysentery and diarrhœa. We know that the bacterial removal effected by such filters is generally greater than 97 per cent., and quite frequently as high as 99.7 per cent.

There remain certain other things upon which judgment is withheld. Among them is the subject to be discussed in this present paper, which is:

Does a properly operated filter with an average bacterial removal of 99.7 per cent. give absolute safety to a water supply irrespective of the character of the raw water or can we filter a dilution of our own and our neighbors' sewage with absolute assurance of protection from typhoid and diarrhœa, when using such filtrate as our water supply?

The apparent existence of residual typhoid fever in towns filtering a periodically infected water supply served to incite the Provincial Board of Health of Ontario to conduct a series of experiments upon slow sand filtration in order to determine just what protection filters afforded.

It was found necessary to approach the problem in an indirect fashion, since one does not know how few pathogenic organisms may constitute an infection, nor what pathological conditions are involved in normal susceptibility to invasions. It has appeared justifiable to assume that absolute protection exists only when the pathogenic organisms are entirely eliminated from the water supply. In the present work it was necessary for convenience to use organisms associated with pathogenic organisms as the measurers of efficiency, and to assume that organisms like B. Coli, Sporogenes Enteridites and Sewage Strepti-cocci, in coming through a filter from the applied water behave as would pathogenic organisms, with possibly certain restrictions as to longevity.

It may appear strange to some that no mention is made of disinfection methods and apparatus which have of late been attached to so many filter plants. The data presented in the attached appendices is primarily evidence as to the reason for disinfection and, it is hoped, an argument for lesser contamination of our sources of water supply.

When filters will not render safe an infected supply without resort to disinfection, is it not high time that the dumping of human excreta bearing the infectious matter into the sources of water supply be rigidly restricted?

It is not complimentary to our civilization, nor pleasant for our citizens to realize that the inhabitants of many municipalities are drinking dilutions of fresh human excreta simply because ratepayers refuse to countenance the expenditure necessary (from $2.50—75c. per capita per year) to treat and disinfect these wastes of human civilization.

In studying the action of the experimental filters some interesting data was obtained (other than that bearing directly upon the main problem) which show the internal resistances existing in the sand throughout the filter, loss of head due to surface clogging and Schmutzdecke formation, and some information with respect to effect of storage.

In presenting the numerous appendices I wish to acknowledge the painstaking and careful work of Frank W. Schofield, D.V.S., who was Assistant Bacteriologist at the Experimental Station during a great portion of period herein reported upon; and to acknowledge the helpful criticism of Dr. J. A. Amyot, Director of the Laboratories of the Provincial Board of Health of Ontario, upon the collection of data and arrangement of apparatus during these experiments.

Description of Apparatus.

The *Sand Filters*, four in number, are circular stave tanks (made from 2-inch cypress) 10.5 feet inside diameter and 8 feet deep. Each tank has a surface filtering area of 1/500 of an acre. The filtering media consists of 13 inches of graded gravel supporting 3½ feet of sand. The analyses of the sands used at various times are given on Graphs No. 9 to 14 and Chart No. 3.

Each tank is provided with loss of head gauges, metal tubes running horizontally and radially from the centre to the sides of the tank and terminating on the outside and at right angles in glass tubes. These are placed at different levels, enabling an observer to note the loss of head for several depths. The head of water on the sand was controlled by an overflow and regulated by a valve at each tank. The rate of filtration was fixed by orifices set in a measuring box which gave a known discharge under fixed head. The flow to the measuring box was controlled by a 2½ in. valve, which during certain parts of the run required setting twice a day; normally it was not touched more than once in three or four days, depending upon loss of head due to Schmutzdecke formation.

The Laboratory was only equipped for bacteriological investigations in the early experiments, but was remodeled 1910-1911 to permit of investigations into sewage purification changes. The bacteria incubators were both of primitive construction but very efficient in action. A blue print of their construction is included herewith. A hot air sterilizer was provided to sterilize the glassware (petri dishes and pipettes). A temperature of 180 to 210 degrees C. was used from forty-five minutes to one hour to effect this. When the spores of the Hay Bacillus interfered with operations, the trouble was always overcome by using a temperature of 210 degrees C. for sterilization.

The Media was prepared at the Provincial Laboratories according to Standard methods governing the same. Plain Agar was used for nearly all the work both at 18-22 degrees C. temperature and for 37 degrees C. Litmus-Lactose Agar and Saffranin-Lactose Agar were used only for special investigations. The fermentation tests were made using Saffranin Lactose Broth. Reactions showing change of color and proper gas production (over 25 per cent.) being reported as positive.+

(—) Gas production without color change and — color change with out gas, similarly.

The media was sterilized in Autoclave sterilizers at the Provincial Laboratories and sent to the Experimental Station in special cases.

The Technique used in plating and in making broth cultures was standard. The Agar was cooled to between 38 and 41 degrees C. before pouring. The inoculation of tubes was made with the aid of well sterilized glassware and was performed with every effort directed towards the minimizing of possibility of contamination. The incubator temperature was carefully watched. The raw and filtered water samples were both subject to the same influences of technique and incubation in order to make strict comparisons. The 37-degrees plates were incubated for 24 hours before counting. The 18-22 degrees plates were incubated for 48 hours before counting. The Colon Bacilli were reported from the presumptive test (incubation for 48 hours at 37°C.).

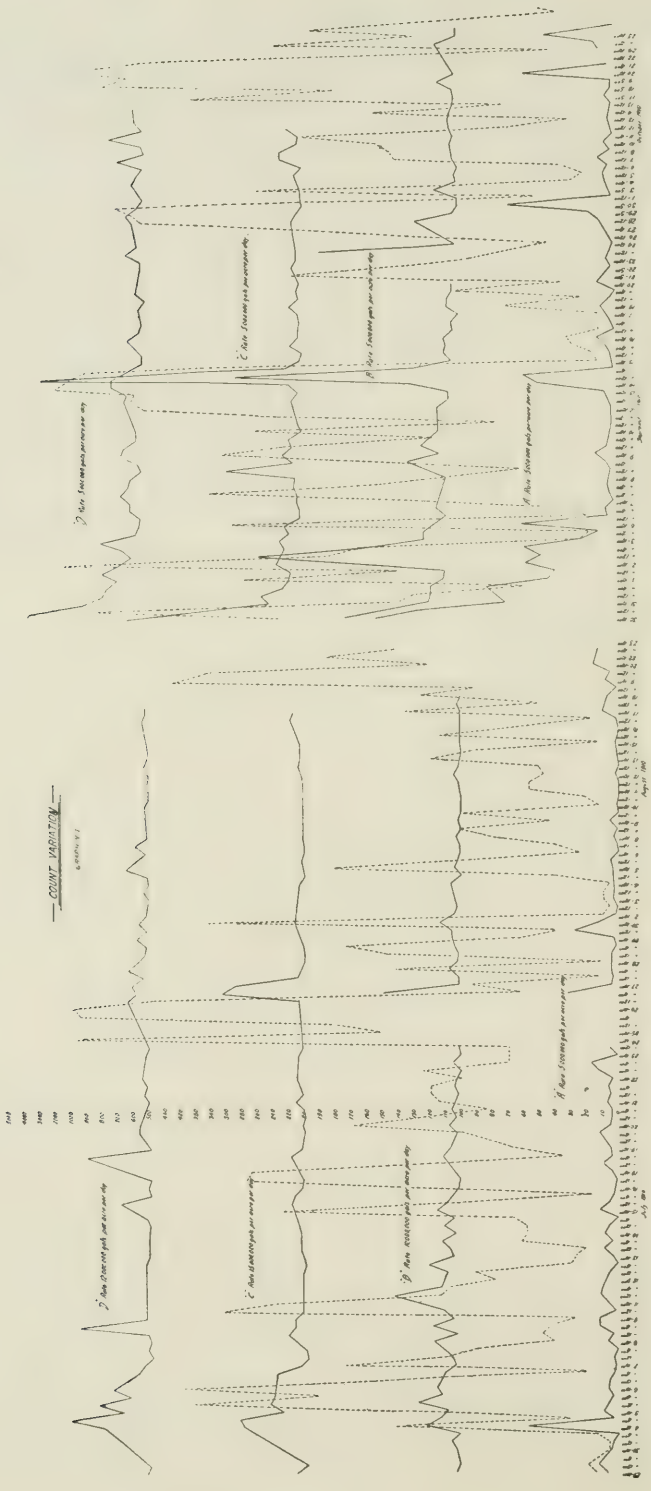
The initial studies of bacterial removal, or rather of the count variation in the effluent from the four slow sand filters, were begun in September, 1909, and continued to April, 1910. The variations present were apparently without any definite relation, hence it was deemed advisable to continue this preliminary work.

Mr. F. H. Chestnut, B.A.Sc., was in charge of the Experimental Station during this period, resigning in April, 1910.

The results from the second series of investigations cover the period between April, 1910, to March, 1911. Many interesting phenomena were observed in this period, some of which were apparently duplications of those existing in the earlier period. Certain relations were suspected, and in general the normal behaviour was becoming more apparent. In order to show this behaviour more conclusively, certain modifications to the existing apparatus became necessary; these were made.

The results of operations from March, 1911, to July, 1912, are the most complete and valuable of the series. They cover to a very large extent the hygienic aspect of filter behaviour. The studies are hardly more than synopsised in this report. The arrangement of the report, while open to many objections, seemed the best in which to present the bacterial data. Every effort has been made to incorporate all this data into the attached appendices and to handle the text in such fashion as to make this data available.

Normal Count Variation: The initial studies covering a period of seventeen months, September, 1909, to March, 1911,—Appendix A—exhibit many instances of abrupt count variation. Graph No. 1 shows this to some slight extent and shows also the absence of any relation between the four filter units in reference to bacterial count. The periodic appearance of B. Coli in filter effluent can be readily observed by glancing over several sheets in the early studies of Appendix "A." It will be further observed that *Colon comes through periodically in considerable quantity—in quantity sufficient for a sanitarian to question the safety of the water during that interval* (if the known origin of the B. Coli organisms was fresh sewage contamination where associates like B. Typhoid and B. Diarrhœa could be present).



Graph No. 1.

Solid lines platted from filter counts.
Dotted lines platted from raw water.

CHART No 1.

BACTERIAL EFFICIENCY OF ALBANY FILTERS

DECEMBER, 1902

DATE	RAW WATER	FILTER								PURE WATER
		1	2	3	4	5	6	7	8	
	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria	Bacteria
1	25000	300		60	23	25	40	200	21	34
2	30000	150		50	26	23	55	175	25	4
3	33000	350		45	23	33	31	350	21	70
4	24000	400		36	24	21	25	250	24	65
5	40000	450		40	18	29	44	200	17	80
6	65000	575		60	30	38	34	240	31	95
8	75000	500	30	75	20	30	60	175	23	120
9	60000	600	50	75	20	48		325	24	140
10	80000	550	350	50	40	35		350	280	180
11	75000	500	400	60	35	30	400	250		150
12	90000	650	800	180	48	100	1100	175		275
13	115000	700	900	200	25	120	1400	225		350
15	140000	800	650	150	55	110	1200	200	500	475
16	180000	900	700	100		90	1500	250	600	500
17	160000	750	800	80		60	950	180	400	500
18	125000	600	700	65		45	900	125	1000	375
19	120000	500	750	70	250	50	850	90	1000	350
20	90000	500	650	100	320	45	700	65	800	400
22	40000	500	550	45	600		650	70	800	500
23	100000	300	175	60	500		325	55	450	300
24	120000	500	350	35	1100		200	80	650	500
26	65000	550	400	60	900	300		70	500	450
27	50000	400	450	60	700	600		50	500	475
29	70000	300	250		200	600	700	50	300	350
30	42000	300	200		400	700	800	45	140	300
31	50000	250	275		350	550	850	45	300	300

BUREAU OF WATER ANNUAL REPORT 1903.

Chart No. 1 is also submitted showing the normal behaviour of Albany filters for December, 1902; in it one observes that, while one unit is practically removing all the bacteria present in the raw water, other units are not so successful and that conditions reverse themselves. In other words, while the efficiency—average percentage removal—is good (or high), the irregularities are numerous even in these few observations. These irregularities must, I believe, be considered normal for filter operations. From the results tabulated in Appendix "A," it is to be observed that the irregularities of two units are not usually coincident with one another, nor are they of any great duration. In all probability this variation is due to imperfect filtration through or retention on part of the unit—supposing only 10 per cent. of a filter unit was working inefficiently, the raw water count being 5,000 and the filter effluent count being 50—average efficiency 99 per cent. removal. From observations extending over several months we note the removal to have been 99.5 per cent. This decrease in efficiency of ½ of 1 per cent. is then due to the action of 10 per cent. of the unit (filter bed), which means that from one part of the bed we get a count of 275 bacteria per cc. The effect on Colon determinations would be slight because, if colon were present in 5 cc. corresponding to 275 bacteria per cc. the mixed flow from the unit would still only show Colon present in 23 cc. instead of 25 cc. More bad types could be present due to imperfect filtration than if the whole bed acted alike, because other factors, such as longevity of the organisms, help out in the one case but not in the other.

From the preceding paragraph one should carry in mind that a change in the bacterial removal efficiency of a filter may mean a considerable change over part of the units, or a small change over the entire area, more probably the former.

It is justifiable to consider municipal units,—that is, those of an acre in extent—as behaving as a summation of small units 1/500 of an acre in extent. The ten-minute variation of the large units might not present the same irregularities as experimental filters discussed here, but the daily behaviour of the municipal units would, however, present similar variations.

When the infectivity of the source of supply is periodically high, these variations when coincident with maximum infectivity (as will be shown later) present danger. It would appear, therefore, that municipal plants could give best protection when of largest extent or when operated at low rates and associated with greatest storage after filtration (we speak of storage ranging from three to four hours to three days—not the English periods of from three to four weeks) in which the count variation and infectivity would be reduced to very flat curves.

It has been suggested that filter units can be cut out when running irregularly; for the following reasons this is not feasible except in exceptional cases:

(*a*) The bacterial count investigations seem to suggest the short duration of these normal irregularities.

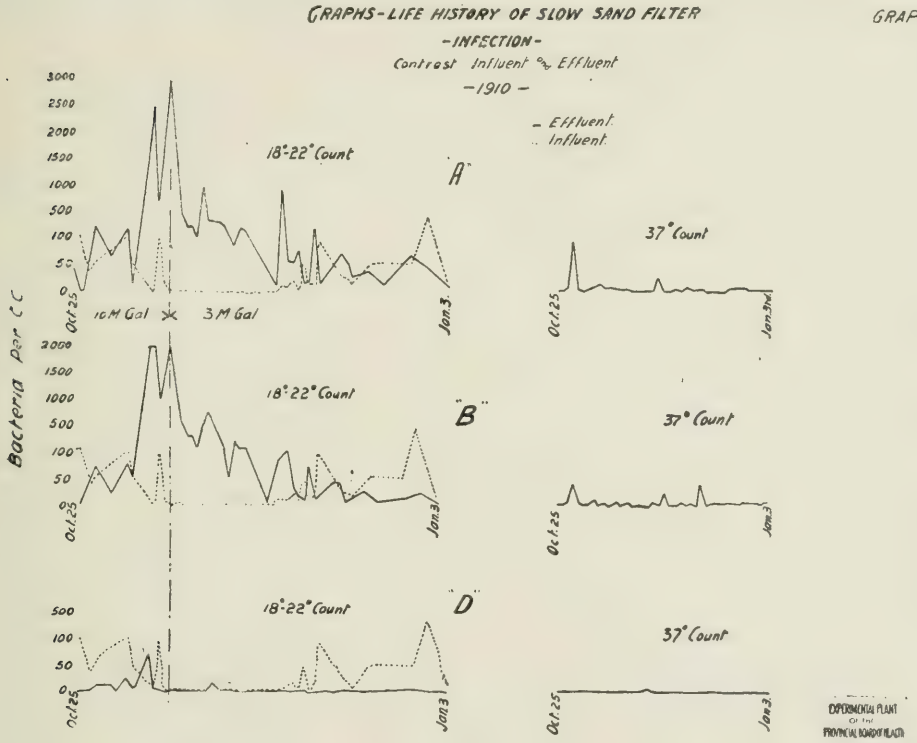
(*b*) The laboratory, and consequently the evidence of irregularity, is always 24 hours, frequently 48 hours, behind the filters.

(*c*) The units are expensive of construction, hence continuous operation is imperative from an economic standpoint.

We had best, therefore, turn to large storage reservoirs (up to three days' supply) to get rid of normal count variations and possible infection; using dilution instead of protecting with manipulation and multiplication of filter units.

Abnormal Count Variations.

1. The least important but most conspicuous of these is that which has been called "Filter Infection" shown on Graph No. 2. Its conspicuousness will readily be granted on account of its duration and character. Graph No. 2 indicates the behaviour of three filters, A, B, and C, each 1/500 of an acre in area and containing the same character of sand. The infection in D was more apparent at an earlier date, which can be verified by referring to Appendix "A" containing the laboratory report on this filter.



For convenience, the raw water or influent count has been plotted as well as the effluent count; it is at once noted that more bacteria are coming through than are present in the applied water, and this continues over a period of about two months. The 37° count, it will be observed, remains rather uniform in character over this period. The only possible explanation is that certain bacterial forms were multiplying in some region of the filter and were being carried away in large numbers by the flow of water downward through th filter media.

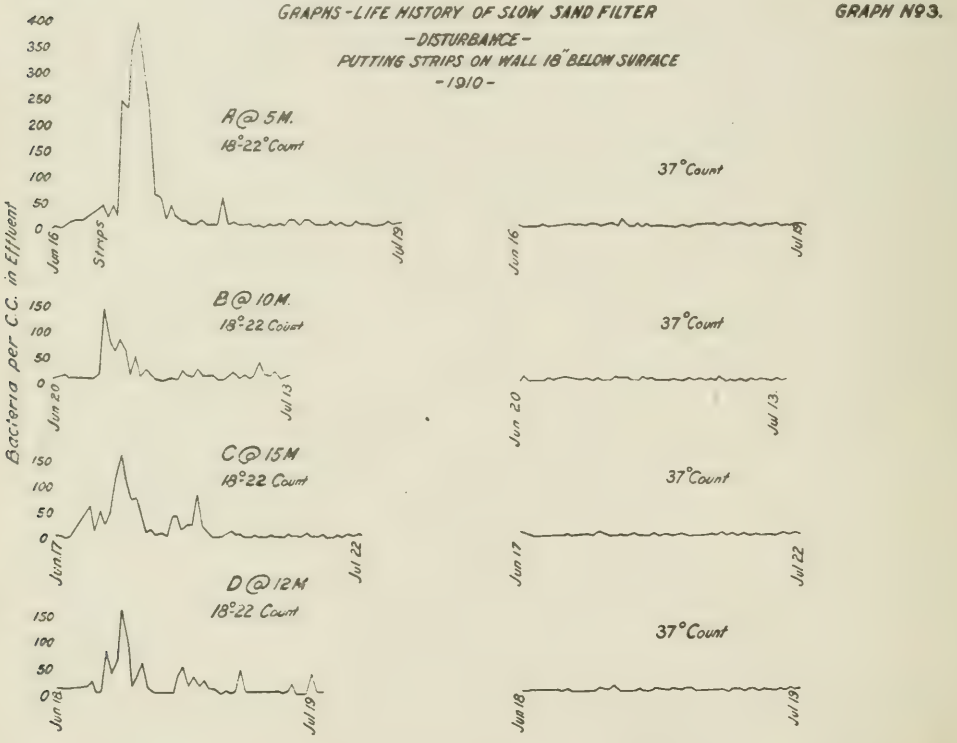
It is idle in this present paper to speculate as to whether the cause of the high count was owing to changing organic content of the water favoring some bacterial forms constantly present in the filter, or to the entrance of some special form which found ideal conditions for multiplication existing in the filter media.

These rapid growing water bacteria have no pathogenic significance, and their presence in a water supply can in no way constitute a menace to public health.

2. The second observed irregularity is termed "Disturbance," and can be divided into the two classes considered herein:

(*a*) Disturbance due to repairs below the sand level, in this case the placing of strips 18 in. below the sand level to prevent side slip, necessitating drainage of the sand with subsequent digging and displacement.

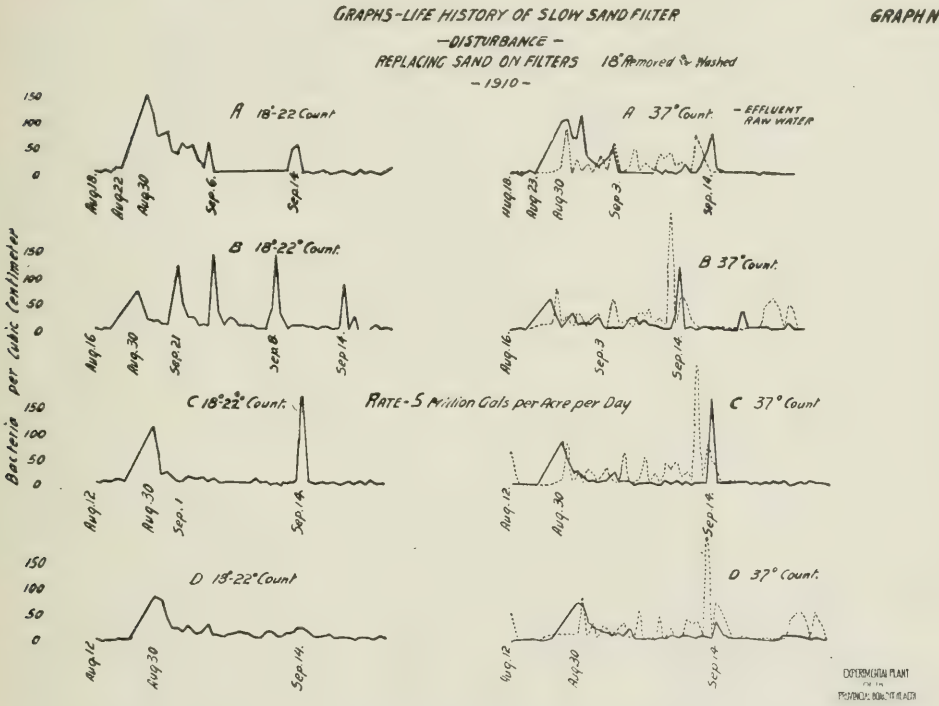
(*b*) The disturbance occasioned by removing several inches of sand (washed prior to replacement) then replacing it and additional sand necessary to bring the bed up to its original thickness of filter media. (In some plants before renewing the sand after a loss of depth due to Schmutzdecke removal operations—of approximately 9 in. to 12 in.—several inches may or may not be removed and washed to prevent subsurface clogging.)



Graph No. 3 is plotted from a disturbance of character (*a*). From examination of the four filter behaviours it seems probable that the loss of efficiency was due either to a washing through of organisms previously existing in the filter together with some of those placed there by the workman's boots and clothing, or to sporadic growth from inoculated forms during the workman's operations. From the fact that the 37° count was entirely unaffected and since the sand was disturbed to within 8 in. of the gravel, the former is probably the closer approximation to the truth.

Graph No. 4 is plotted from a disturbance of character (*b*). Irregularities of this character are the most serious yet mentioned. The efficiency variation is most erratic, showing considerable variation in the 37° count as well as in the 18-22° count. The disturbance indicated that, when the Schmutzdecke harboured any pathogenic organisms retained in the process of filtration, the organisms remaining in the sand after it was replaced on the filters found a way to the under drains and thence to the effluent box.

It is further to be deduced that, if for convenience and economy or some other reason highly contaminated water be used to wash such sand just before replacing it, the effluent will present strong evidence of this contamination coming through the filter for a period of varying duration after the renewal of operations.



From the foregoing information with reference to the effect of disturbances, we ought to insist upon several simple precautions in the interest of public health:

(*a*) To store all Schmutzdecke sand for at least one month before replacement.

(*b*) The Schmutzdecke sand to be washed—not just before replacing, but at the time of removal from the filters.

(*c*) The storage bins to be arranged so that sand first entering would be also removed first by means of hydraulic jets or other adequate devices.

(*d*) The several inches of sand removed just before re-establishing proper depth of sand to be treated as Schmutzdecke and not put back on the filter without storage, unless special bacteriological examinations have been made as to its freedom from pathogenic organisms or organisms as B. Coli associated with pathogenic organisms.

TAKING UP OF EFFICIENCY
SEASONING
Average raw water count = 3000 Bacteria per cc
Datum Filter A
Datum Filter B
Datum Filter C
GRAPHS - LIFE HISTORY of SLOW SAND FILTERS
B and C New Sand
B - Silica C - Carbonate Ft. Sand
A old Sand Lake Washed
A 6 months old B and C not Washed
Rate 5 Million Gals per acre per day

(*e*) That special bacteriological examinations be made of the filter effluent when treating contaminated water before connecting the filter to the main pure water reservoir after re-establishing sand levels.

(*f*) A subsidiary reservoir to receive effluents pending results of bacterial examination would be of economic importance.

Owing to the press of other work and lack of laboratory assistance very little further information was obtained as to the behaviour of the filters until March, 1911, when observations were recommenced under different conditions.

It was then possible to inoculate the raw water—Toronto tap water—with sewage. The sewage was run into the raw water control tank, fairly continuously in a very small stream (about 1-400). In order to eliminate any chance effect of residual free chlorine—the Toronto authorities were adding to the city water approximately .33 parts of available chlorine per million—the samples of the influent to the filters were taken from the water over the filters about 8 in. above the sand. The inoculated forms were subjected to the possible action of any residual chlorine present for approximately four hours before the collection of samples for bacteriological analysis. The effect of residual chlorine upon the efficiency of the filter can be dismissed as of no consequence; evidence to corroborate this can be obtained by examining the effluent counts during filter failure in Appendix "B."

The raw water and filtered water counts were determined from 18°-22° incubation, 37° incubation and quantitative determinations were also made for Colon bacilli. The three determinations for all samples—Appendix "B"—serving as a check on the character of the variation and illumined the hygienic significance of filter failure.

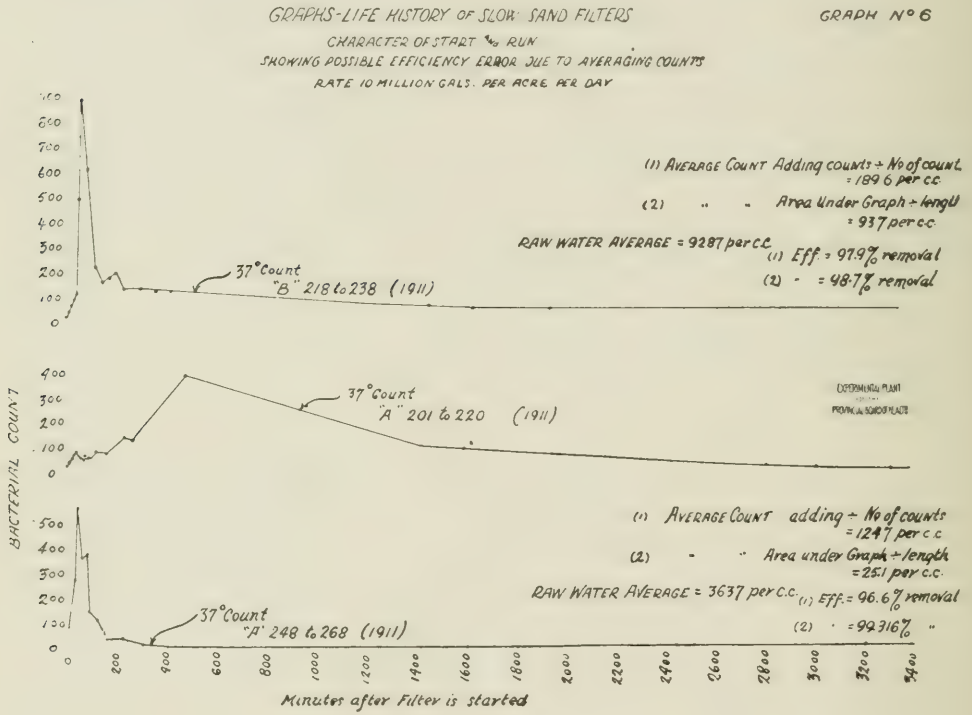
Graph No. 5. *Taking up of efficiency* is plotted from bacterial counts tabulated in Appendix "B." The slow sand filters were, at the time of application of infected water, known to be free of intestinal organisms. The effluent shortly after commencing operations, however, contained them; the manner in which they passed through the filter is unknown. The counts, as the straight line curve shows, were very irregular for what might be termed as "Ageing Period," after which the counts were such as to give 99.4 per cent. efficiency. The time required to complete this ageing is, in the writer's opinon, dependent entirely upon the organic matter attached to the sand particles, that is, upon the bacteria and organic matter in the raw water. Usually the organic matter of the sand from its previous environment is lost in subsequent washings and dryings, before the bed is put in operation. A somewhat similar case is presented when sewage is first turned into a sprinkling filter or intermittent sand bed. The maximum efficiency is not obtained until an organic growth has attached itself to the particles forming the nitrifying or straining bed.

Ordinary passage of water slowly through a media of sand appears to remove from 80 per cent. to 90 per cent. of the bacteria. The first part of Graph No. 5 indicates that peculiar conditions or arrangements of the sand or sand surfaces must come to pass before the purification is 99.4 per cent., such purification being only associated with a filter handling a raw water of high bacterial content (average about 10,000 per cc.), the bacterial types being numerous.

The maintaining of a 99.4 per cent. of efficiency is a delicate operation. In filter operations one finds numerous effluent counts well above the efficiency average.

This is well shown in Appendix "C," and is probably characteristic of all filter operations. Raw water and effluent counts appear to be somewhat sympathetic at times of filter disturbances. A consideration of the bacteriological reports in Appendices "A" and "B" shows this, as also Graph No. 1.

Graph No. 6 "*shows the character of start and run.*" These three straight line curves were plotted from the 37° count; this count practically eliminates the possibility of effluent being affected by multiplication of organisms in the filter sand or gravel. The sudden rise in count just at the beginning of the run is most remarkable. A proper efficiency seems to be established in about three hours.


GRAPHS-LIFE HISTORY OF SLOW SAND FILTERS
GRAPH N° 6
CHARACTER OF START & RUN
SHOWING POSSIBLE EFFICIENCY ERROR DUE TO AVERAGING COUNTS
RATE 10 MILLION GALS. PER ACRE PER DAY
(1) AVERAGE COUNT Adding counts ÷ No of count. = 189.6 per c.c.
(2) " " Area Under Graph ÷ length = 93.7 per c.c.
RAW WATER AVERAGE = 9287 per c.c.
(1) Eff = 97.9% removal
(2) " = 48.7% removal
37° Count "B" 218 to 238 (1911)
37° Count "A" 201 to 220 (1911)
(1) AVERAGE COUNT adding ÷ No of counts = 124.7 per c.c.
(2) " " Area under Graph ÷ length = 25.1 per c.c.
RAW WATER AVERAGE = 3637 per c.c. (1) Eff. = 96.6% removal
(2) " = 99.316% "
37° Count "A" 248 to 268 (1911)
BACTERIAL COUNT
Minutes after Filter is started

Graph No. 7 "Count Variation" shows a most unusual sympathy between the two temperature counts on the filter effluent. That such sympathy does exist at time is most conclusively shown by these two graphs. As a rule the difference in the 18°-22° count and the 37° count of the raw water prevents any such exhibition of sympathy in the effluent counts.

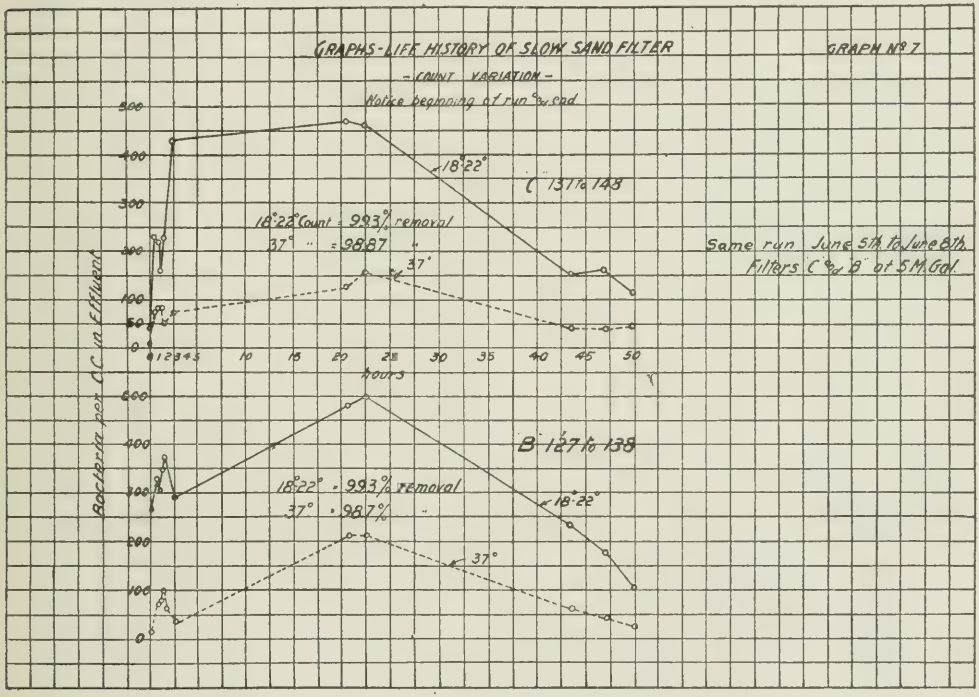
It would appear justifiable in concluding from the evidence presented in Graphs Nos. 4, 5, and 6 that organisms come through the filter and in a definite fashion.

This is what has been suspected for some time and what reports like that of Albany on Chart No. 1 leads one to believe. Owing, however, to the fact that count determinations had not been specific enough nor backed by 37° counts and quantitative colon tests, none would declare with confidence that a portion of the raw water organisms normally passed *through the filter,* the epidemiological evidences seeming to show the contrary.

We have sufficient experimental evidence in the attached appendices to warrant the statement that normally a varying portion of the raw water bacteria passes through the filters. If colon and typhoid organisms are present in the raw water, a certain proportion of them must pass through the filters and be present in the filter effluent; this proportion may be either greater or less than the bacterial efficiency of the filter.

The next problem of importance was to discover how long it took for organisms to pass through the 40 inches of sand acting as filter media.

One of the experimental filters was remodelled and special tubes inserted from the sides into the filter sand. A valve was placed at one end and a 150-mesh-to-the-inch screen at the other. The tubes were spaced at depths of 6 inches apart right down to the gravel. Samples could be taken from almost any zone in the filter media.



From the laboratory arrangement of inoculating the water with sewage to increase the bacterial count, a raw water could be fed to the filters which either contained or was free from intestinal bacteria at the operator's will. It was thus an easy matter to start the filter and run till all traces of intestinal bacteria were absent both from the effluent and applied water, and then to add sewage in small doses to the effluent and to watch the effluent very closely for first appearance of intestinal bacteria.

Appendix "D":

Table No. 1 shows this work.
Tables Nos. 2 and 3 show internal counts.

Quality of Effluent.

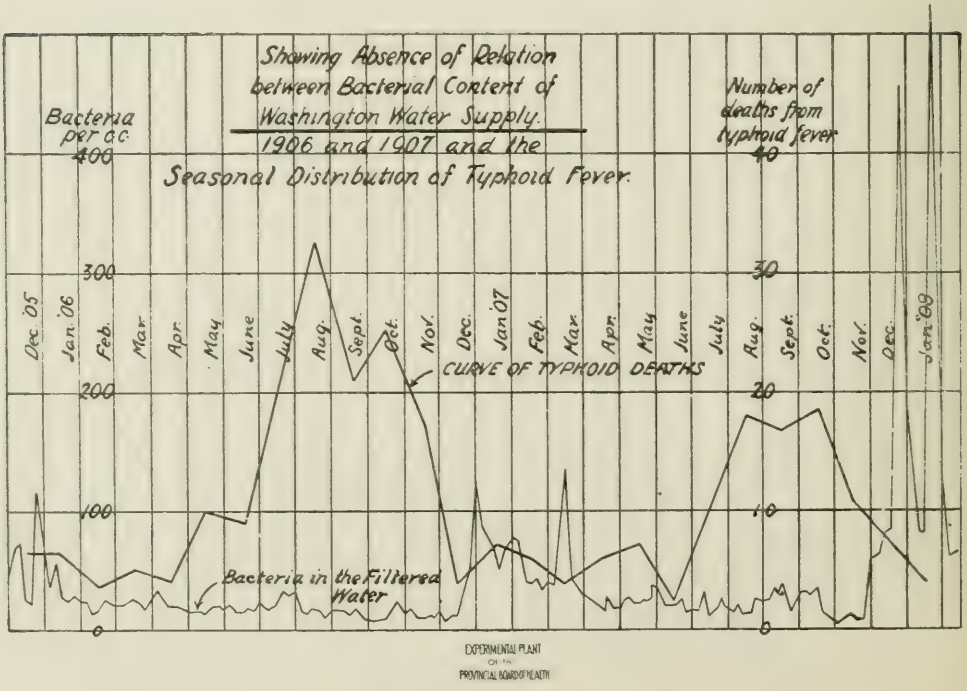
We must observe from Appendix "D" that the B. Coli organisms came through in some quantity within three hours. We, therefore, are compelled to admit that infective organisms would probably come through if present in the raw water in the same time interval.

Filter protection is not due to retention of the effluent organisms in the sand layers till a longevity factor causes extermination. The protection is absolute retention of the major portion of the organisms. The majority of the organisms present in the effluent may have been in the upper raw water three or four hours previously. We must rely for protection upon the number retained and not upon the character of those coming through. This leads us to another important factor in filter operation:

Quality of Raw Water or Relative Infectivity of the Raw Water Previous to Filtration.

A history of water-borne typhoid epidemics would not show that the epidemics were always coincident with an increased bacterial count of either raw or filtered water, but would of course be coincident with increased infectivity. Constant sewage pollution would give high counts and frequently epidemic diarrhœa, but would not give epidemic typhoid till the sewage contained the dejecta or excretions of typhoid patients or carriers. The presence of this infectious material need not increase the bacterial count, and might possibly be coincident with a lower bacterial count. This is true for a filter effluent as well as for any unfiltered or raw water.

GRAPH No 8.



Spencer Crosby in reporting upon the prevalence of typhoid in the District of Columbia concluded that the typhoid infection was not water-borne, because of its coincidence with maximum efficiency in the slow sand filters. (Graph No. 8.) No weight was placed upon the possibility of changing infectivity of the raw water—the Potomac River! Maximum infectivity can be coincident with maximum efficiency and with low effluent count.

Infectivity of Effluent.

It is interesting to note that Prof. Koch in 1893 in his report on "Water Filtration and Cholera" concludes that the process of water filtration at Altona had suffered disturbances such as to occasion a typhoid epidemic which could be ascribed to the water supply. It was further observed that the epidemics usually developed in connection with a long period of frost. Prof. Koch, finding parts of the filter frozen, attributed the failure and subsequent epidemic to freezing. This was not at all conclusive, as the bacterial evidence presented did not show more than what we have chosen to call "normal variation"—the efficiencies being over 97.4 per cent. in the worst instances of failure, while the average for that period was over 99.0 per cent.

At Neitleben, Prof. Koch found the filters had not prevented a severe cholera epidemic; the efficiency of these filters was 82 per cent.; the raw water was very highly infective. It is reasonable to assume that cases would have occurred with a 99.4 per cent. efficiency, owing to the amount of infection present in the raw water.

The argument is plain. If we can get severe epidemics at times when filter efficiencies run as low as 82 per cent. and become co-incident with maximum infectivity, then it is most assuredly proper to assume that residual typhoid must always exist in a community filtering a periodically infective raw water. The precautions now being taken by using disinfectants, together with filtration, show very clearly the trend of public health authorities' opinions.

Returning to the results from the experimental filters, take for example the chart in Appendix "D," Table No. 1. Filter No. B on June 24th at 10.00 a.m. The filter effluent count of bacteria growing at 37°C. is 4 per cc., but observe no colon in 100 cc. Whereas on June 25th at 3.30 p.m. the count for 37°C. was 0 per cc. and colon was present in 5 cc.—a water relatively 20 times more dangerous than the other. It will not do to dismiss the possibility of filter-typhoid when the raw water has periods of high infectivity. Supposing a municipality using an infected river water as a municipal water supply and with a typhoid death-rate of 85 per 100,000 (very high) has, after installing a good filtration plant, a typhoid death-rate of 22 per 100,000. If the rural rate throughout the district was down to 14 per 100,000, we would be much more justified in suspecting a residual typhoid rate from the filtered water than from external agencies, common alike to the urban and rural districts, providing of course that conditions are such as to exclude local fly and milk epidemics, which would disproportionately increase the death-rate for the community.

Knowing that filters do not absolutely protect a water supply, it behooves us at all times to seek the least infected source for water, even at a greatly increased expense; having procured that, to eliminate the major portion of the existing infection. This is the force behind the demand for disinfection of sewage.

The benefit of a lessened infectivity of their water supply will be most observable in those cities drinking dilutions of their own sewage—such as Chicago,

CHART No 2

TYPHOID CASES AND DEATHS FOR ALBANY (SHOWING EFFECT OF FILTRATION)

MONTHS	AVERAGES 1891-1899		AVERAGES 1900-1911		PERCENT REDUCTION	
	CASES	DEATHS	CASES	DEATHS	CASES	DEATHS
JANUARY	61·7	9·1	8·5	1·6	86·2	82·4
FEBRUARY	52·4	8·8	6·8	1·4	87·2	87·2
MARCH	63·7	10·2	6·4	1·9	89·9	81·4
APRIL	34·7	8·0	5·0	1·7	85·6	78·8
MAY	15·7	4·1	3·9	1·0	75·2	75·6
JUNE	13·4	3·2	2·7	1·3	79·8	59·4
JULY	18·4	3·2	5·0	1·3	72·8	59·4
AUGUST	34·0	6·6	13·0	3·0	61·8	54·5
SEPTEMBER	25·8	4·0	16·8	1·7	34·8	57·5
OCTOBER	30·7	3·6	9·3	1·5	69·7	55·5
NOVEMBER	37·2	4·6	6·0	2·3	83·9	50·0
DECEMBER	38·2	6·0	8·3	1·5	78·3	75·0
TOTALS	425·9	71·3	92·7	20·2	78·2	71·7

SEP. 6 1899 FILTERS STARTED
YEARS 1891-SEP 1899 2/3 SUPPLY UNFILTERED WATER HUDSON RIVER
" " 1/3 SUPPLY UNFILTERED GRAVITY SOURCE
YEARS 1900-1909 2/3 SUPPLY FILTERED HUDSON RIVER
" " 1/3 SUPPLY UNFILTERED GRAVITY SOURCE
MAY 7. 1910 TO DATE 96 PERCENT FILTERED

POPULATION CENSUS OF 1890 = 94923
" " " 1900 = 94151
" " " 1910 = 100253

BUREAU OF WATER 1911.

Cleveland, Toronto, and Zurich. The filtration of the water at Zurich, together with treatment of the sewage, decreased the typhoid rate in a graded way. The minimum rate was not obtained immediately after the installation of the filters — which changed the typhoid rate abruptly from approximately 65 to 18 deaths per 100,000. Lowest rates were obtained as the infectivity lessened from the decrease in the number of cases, and consequently decrease of infectious material in the sewage which contaminated the water supply, the minimum reached being 6 and less per 100,000.

Chart No. 2 shows the manner in which Albany's typhoid has been reduced by installing slow sand filters. Typhoid in Albany, as one will note, has by no means been eliminated. This is a city where it is fair to speak of residual typhoid. Disinfection apparatus has been added to the filter plant since 1911.

Bacterial Efficiencies.

The list of bacterial efficiencies obtained from the experimental filters during their entire period of operation is contained in Appendix "C."

The *"Percentage Removal"* is somewhat variable when the raw water is either normally or periodically low in count, and is helped out by abnormally high counts in the raw water. It is not reliable evidence when passing judgment upon the quality of the filter effluent, unless the maximum count is presented together with the average and backed by quantitative fermentation tests for B. Coli to 100 cc. When all this evidence is at hand, rational judgment based on the same can be pronounced.

Take for example the two runs of filter A—June 26th to June 30th, and July 4th to July 6th. In the former the percentage removal was 99.9 against 98.5 in the latter. The latter, while apparently showing considerably the best effluent, and having least eccentricity in the 18°-22° count, has on the other hand a 37° count entirely contradictory and more indicative of the true condition of the filter performance.

Both 18°-22° and 37° count averages are submitted and are self-explanatory. The dates correspond with the dates on Sheets of Appendices "A" and "B."

It was observed that irregularities in count occur as frequently after Schmutzdecke formation as at beginning of runs (6-100 hours after starting). The counts are not necessarily uniform between samples when two consecutive samples show approximately the same number of bacteria per cc. When comparing the results of filtration in Appendix "B," weight must be given to the character of the sand. Each filter contained a different sand.

The sand analyses are shown in Graphs Nos. 9, 10, 11, 12, 13, and 14. Chart No. 3 is a comparison of some sands used in slow sand filtration from which it is to be observed that the sands used at the experimental station were by no means unusual to municipal plants.

The results tabulated in Appendix "B," relating to Colon Bacilli removal, are very important and worthy of the closest study, bearing out what variations in infectivity may mean to a water supply.

The dates of periods when irregularities were present can be located by maximum counts on the monthly average sheets in Appendix "C" and examined in detail in Appendices "A" and "B."

Effects of Storage.

Counts showing the effects of storage were taken in those intervals when filters were resting prior to cleaning or before starting after cleaning. These counts show:

(*a*) There is usually no increase in the count due to storage after filtration at normal water temperature—(7.5°-13°C. Lake Ontario).

(*b*) Where an increase in count occurs during the period before starting after cleaning, it is usually also present in the 37° count, which would indicate that through some agency (possibly the sudden opening of the effluent valve in taking the samples) organisms came from the filter into the underdrains. These organisms could not have been carried down by water, because the filter was not being operated. Their release was probably due to resistance pressure changes in the filter, an increase in the effluent count apparently being normal after scraping or cleaning a filter.

It appears that storage of filtered Lake Ontario water would not be attended with multiplication of the bacteria normally present. An increase in a stored reservoir water count in 48 hours, above that due to unequal mixture, would indicate external contamination rather than multiplication of organisms present. Naturally the character of growth on the plate would be used as additional evidence to explain such a phenomenon.

The monthly average sheets of Appendix "C" contain considerable evidence relating to length of run. On them is marked the length of run in hours. The length of run was most irregular for the Toronto situation. The variation shown by these small units is most remarkable, the averages being disappointing from an economic standpoint. The amount of water passing per acre per run was very low as compared with Albany. The general average per acre per run from the experimental filters was 46,658,000 gallons, whereas Albany filtered 123,715,000 gallons per acre per run, year ending 1911, and 209,284,000 gallons per acre per run, year 1910. (Albany situation helped by pre-filters.)

The experiments show that other conditions than character of sand and amounts of turbidity present in the raw water affect the length of run. Two units of the same sand and filtering the same raw water exhibit wide variation. Variations are also present in the runs between scrapings for Albany Filters 1909-1910. Chart No. 4.

It was observed in connection with the experimental filters that, during the very short runs, the internal resistances behaved peculiarly, and

(1) That there was rapid loss of head at starting, the filter only running two or three days before cleaning was again required. The water on these occasions showed no marked turbidity and other filters operating at the same time were not appreciably affected.

(2) The gauge tubes indicating the internal resistances did not respond quickly to manipulations of the control valve.

(3) The surface layers showed a large loss of head over that usually considered as sand resistance. (This can be observed in loss of head per foot of sand in Appendix "F.")

(4) The water would not filter fast. Rates higher than ten million gallons per acre per day were not obtainable. At other times filtration as high as twenty million gallons per acre per day was readily obtained.

Occasional short runs are something that must be allowed for in the number of surplus units beyond actual requirements. Charts 4 and 5 compiled from the Albany reports give an idea as to the effect upon general operation.

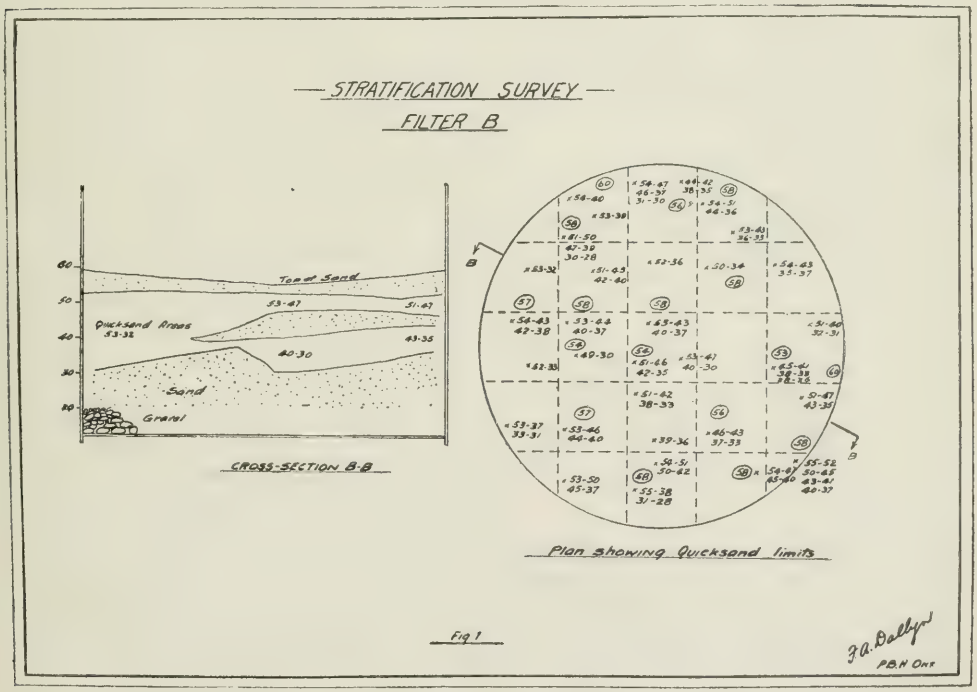
There are normally many stratification changes taking place in a filter. In probing a filter bed during the earlier experiments, certain areas were discovered to be of a quick-sand character. Tests were repeatedly made to determine whether these were normal, and it would appear that they are. Three different sands were used:

(*a*) Lake washed carbonate sand Eff. Size 23 M.M. Unif. Coeff. 1.5.

(*b*) A fine silica sand Eff. Size .166 M.M. Unif. Coeff. 1.84.

(*c*) A pit carbonate sand placed without washing Eff. Size .188 M.M. Unif. Coeff. 2.18.

The results of one probing is shown graphically in Fig. No. 1, which emphasizes the peculiar stratification. Stratification did not seem to cause any bacterial removal changes, but most undoubtedly affected resistance and length of run. Probing re-established effective head and caused a maintenance of head out of all proportion to the Schmutzdecke disturbance in probing.



Some new evidence was sought in connection with agencies causing changes in length of run. A measurement was made of what we have termed the *Filtration Openings,* or passage way for water through the sand, and determined by measuring the total voids and deducting therefrom capillary water held when the bed is drained. It was found that for the silica sand in Filter "B" the percentage void was 37.1 per cent. of total volume, and upon draining the volume of water obtained (measure of filtration opening) from these voids, it was only 1.68 per cent. of the total volume, or 4 per cent. of the total voids.

A mechanical filter sand was examined, Eff. size .39 M.M. Unif. Coeff. 1.6, in which the percentage voids was determined as equal to 40.7 per cent. of the total volume and the "filtration openings" as equal to 21.6 per cent. of the total volume, or 53.03 per cent. of the total voids. The two sands exhibit considerable difference in the relation of "filtration openings" to total voids.

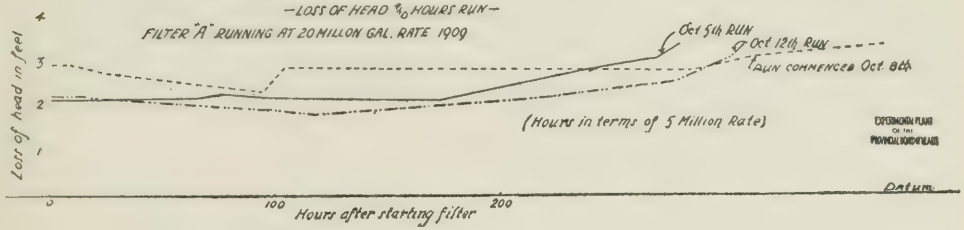
A third sand was used, that in Filter "C," Eff. size .188 M.M. Unif. Coeff. 2.18. The percentage voids were found to be 34 per cent. of total volume, the filtration openings 2 per cent. of the total volume or 7 per cent. of the total voids. Unfortunately, these experiments on "filtration openings" had to be temporarily abandoned.

It is reasonable to assume that greatest length of run will be associated with greatest per cent. of "filtration opening," and that where at all possible the sand be selected with that end in view, the eff. size being the limiting factor.

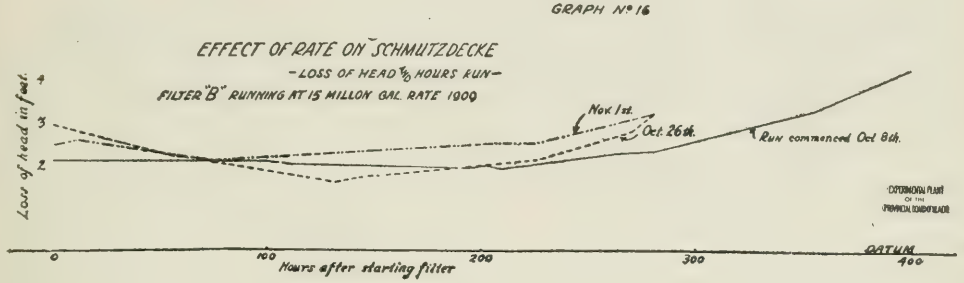
Schmutsdecke formation can be most easily observed by plotting the loss of head and hours run on Graphs such as Graphs Nos. 15, 16, 17, 18, 19, and 20. The abrupt change in the direction of the loss of head shows where the Schmutzdecke is beginning to influence loss of head. The curve ascends rather abruptly after this distinct change in direction. It has been stated before that proper bacterial efficiency from the filters is obtained long before the loss of head exhibits any influence from Schmutzdecke formation. Generally speaking, normal changes in resistance and loss of head were not observed to have any effect upon bacterial removal.

It was observed that after a good Schmutzdecke had formed it required an interval of from 2 to 12 hours to drain the bed before scraping. It was found necessary to put in syphon overflows to carry this water off. In practice, apparatus should always be provided to run this surface water back to the pump well instead of attempting to drain it through the Schmutzdecke to the underdrains.

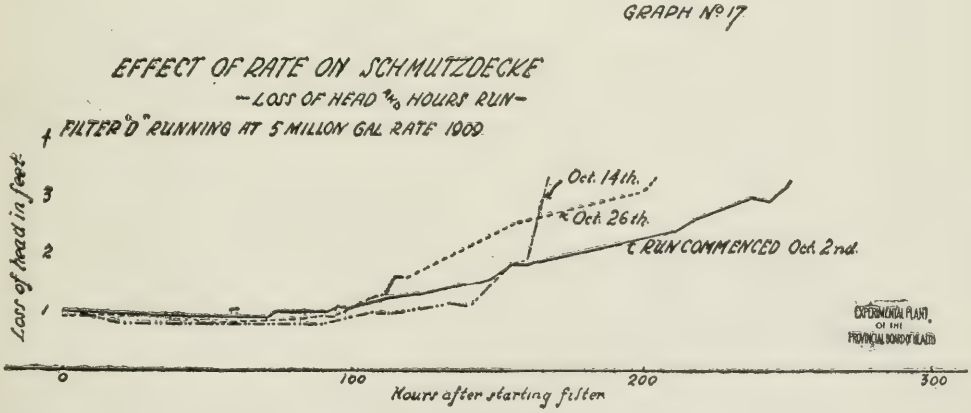
GRAPH No 15


EFFECT OF RATE ON SCHMUTZDECKE
—LOSS OF HEAD % HOURS RUN—
FILTER "A" RUNNING AT 20 MILLON GAL. RATE 1909
Oct 5th RUN
Oct 12th RUN
RUN COMMENCED Oct 8th
(Hours in terms of 5 Million Rate)
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH
Loss of head in feet
DATUM
Hours after starting filter

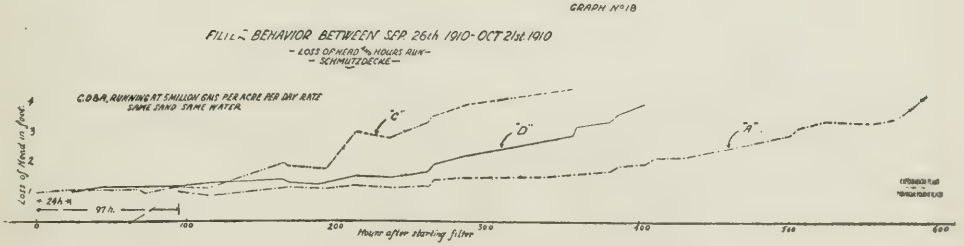
GRAPH No 16


EFFECT OF RATE ON SCHMUTZDECKE
—LOSS OF HEAD % HOURS RUN—
FILTER "B" RUNNING AT 15 MILLON GAL RATE 1909
Nov 1st.
Oct. 26th.
Run commenced Oct 8th.
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH
Loss of head in feet
DATUM
Hours after starting filter

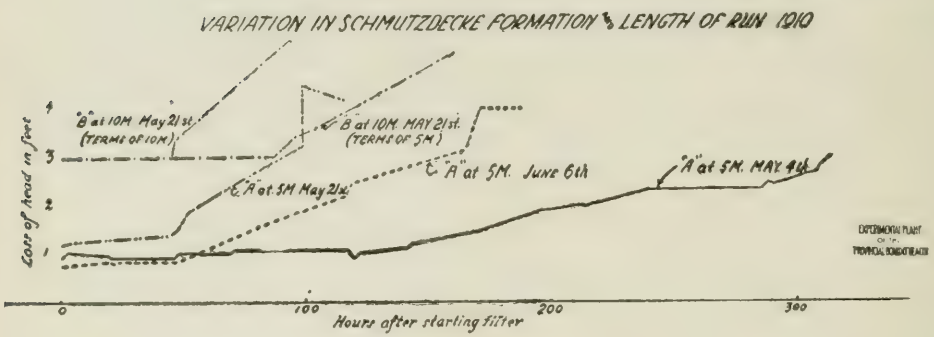
GRAPH No 17


EFFECT OF RATE ON SCHMUTZDECKE
—LOSS OF HEAD % HOURS RUN—
FILTER "D" RUNNING AT 5 MILLON GAL RATE 1909
Oct. 14th.
Oct. 26th.
RUN COMMENCED Oct. 2nd.
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH
Loss of head in feet
Hours after starting filter

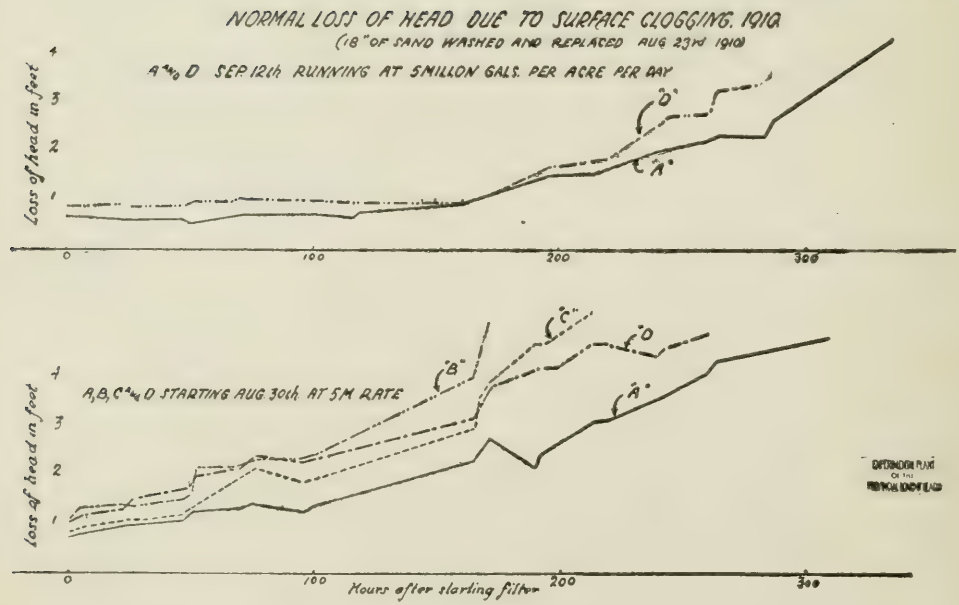
GRAPH No 18


FILTER BEHAVIOR BETWEEN SEP. 26th 1910 - OCT 21st 1910
— LOSS OF HEAD % HOURS RUN —
— SCHMUTZDECKE —
C.D.&A. RUNNING AT 5 MILLON GALS PER ACRE PER DAY RATE
SAME SAND SAME WATER
"C"
"D"
"A"
24 h.
97 h.
Loss of Head in feet
Hours after starting filter

GRAPH Nº 19


VARIATION IN SCHMUTZDECKE FORMATION & LENGTH OF RUN 1910
"B" at 10M May 21st. (TERMS OF 10M)
"B" at 10M MAY 21st. (TERMS OF 5M)
"A" at 5M May 21st.
"A" at 5M. June 6th
"A" at 5M. MAY 9th
Loss of head in feet
Hours after starting filter
0
100
200
300

GRAPH Nº 20


NORMAL LOSS OF HEAD DUE TO SURFACE CLOGGING. 1910
(18" OF SAND WASHED AND REPLACED AUG 23rd 1910)
A & D SEP 12th RUNNING AT 5 MILLION GALS. PER ACRE PER DAY
A, B, C & D STARTING AUG 30th AT 5M RATE
"A"
"B"
"C"
"D"
Loss of head in feet
Hours after starting filter
0
100
200
300

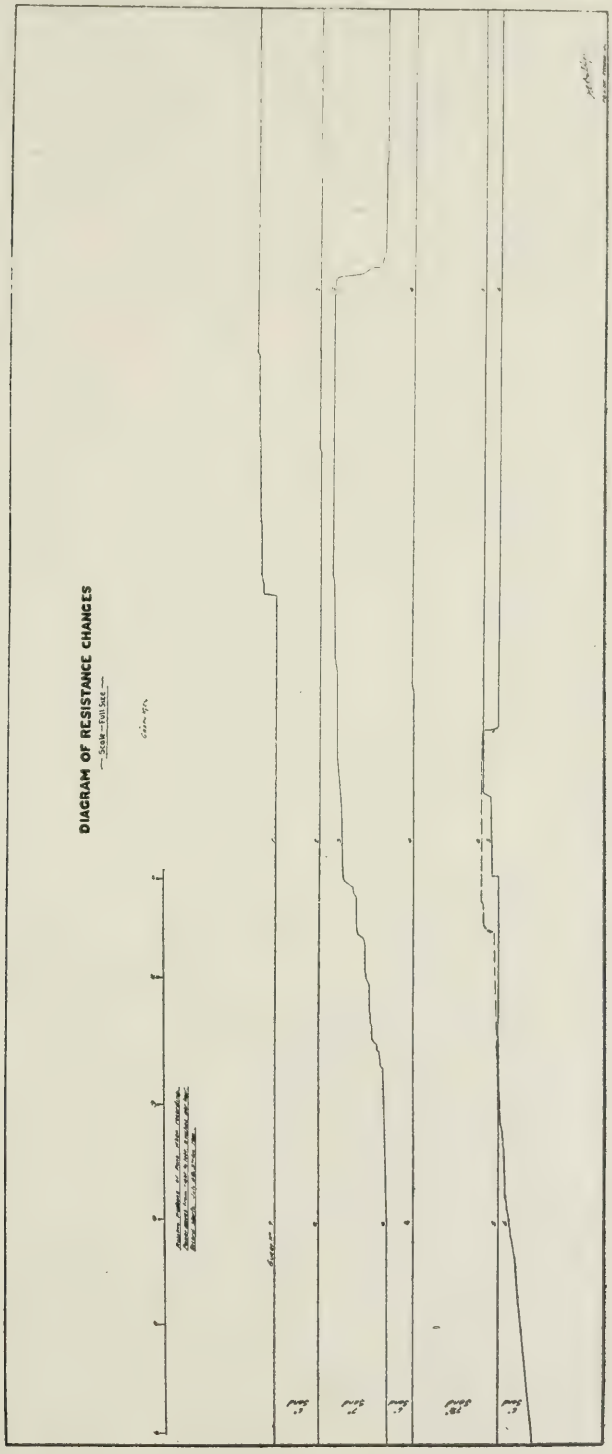


DIAGRAM OF RESISTANCE CHANGES

It was observed that the resistance offered by one foot of sand changes rather unaccountably during the run of a filter. Appendix "F" is obtained from daily and hourly observation. These irregularities should be borne in mind when discussing stratification of sand on page 64. Graph 21 shows the manner in which the resistance changes. The changes were automatically recorded on a sheet of paper revolved by clock work. The Graph shows that negative pressures occur in the sand. This appears like evidence of crust formation and shows how probing would help out the loss of head. Short runs would likely be associated with the presence of these incrusted areas.

Resistances computed with the formulæ presented by Hazen (1901) were compared with those actually existing in the filters; in no case could they be said to be at all alike.

$$V = cd^2 \frac{H}{L} \left(\frac{t \text{ fah} \div 10}{60}\right)$$

is not a reliable formula. In practice it will be found much more advantageous to set up a small filter, say 10 feet in diameter, and to determine the resistance and length of run experimentally. Values obtained by using the formula are too inaccurate to be of use in computing lateral filtration to underdrains, in estimating initial loss of head and when determining filtered water reservoir elevation for gravity systems.

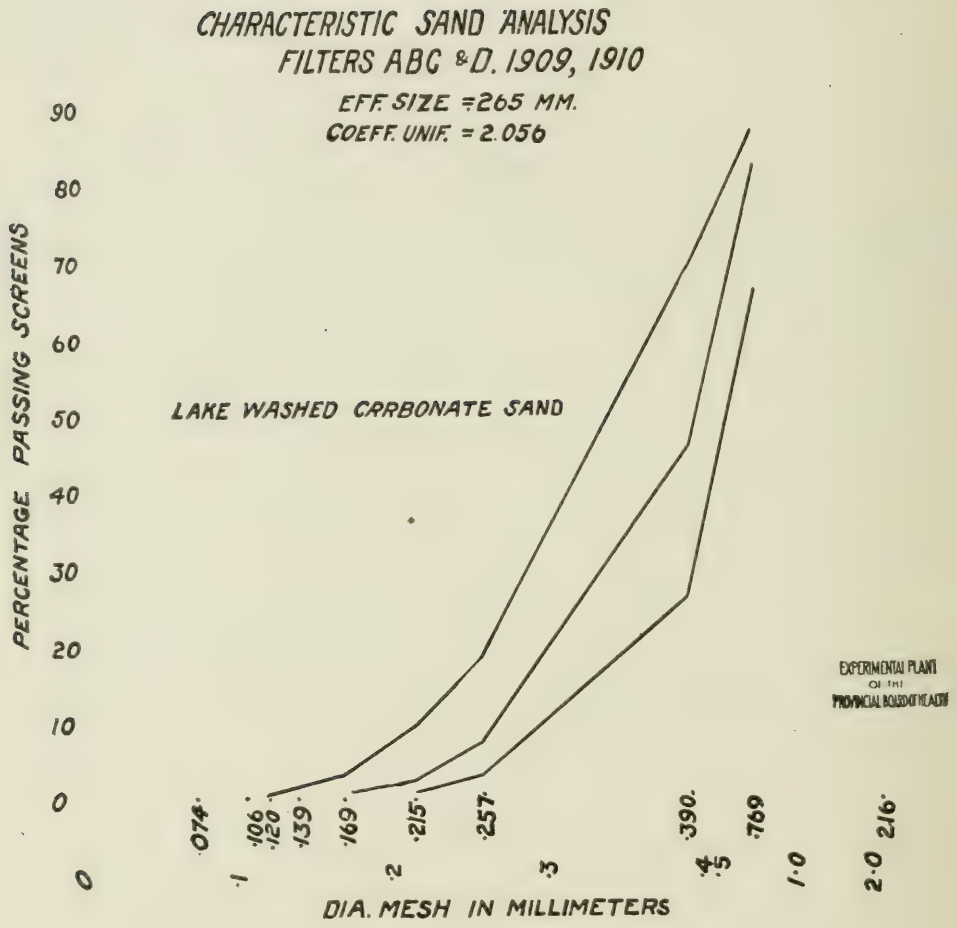
CHART No 3

COMPARISON OF THE ANALYSES OF SOME SANDS USED IN SLOW SAND FILTRATION

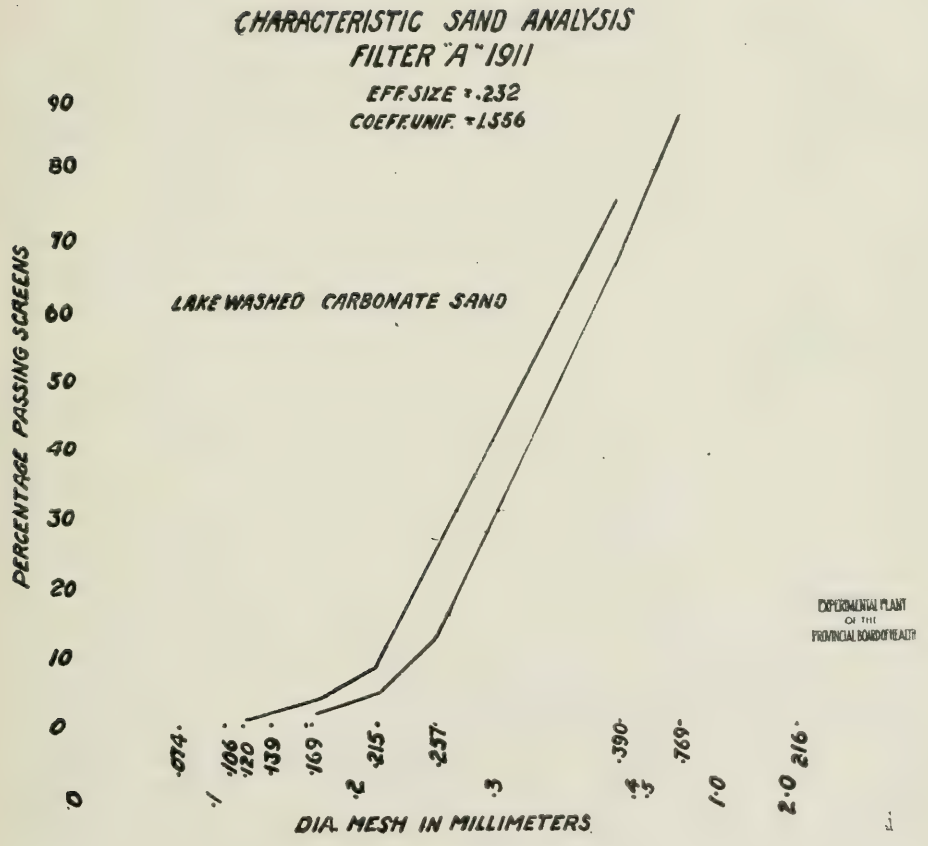
SOURCE	EFFECTIVE SIZE; 10% FINER THAN MILLIMETERS	UNIFORMITY COEFFICIENT	REMARKS
LONDON Eng.			
East London Co	.37	2.0	Old dirty Sand - Washed.
Grand Junction	.41	3.7	Old Sand - Freshly Washed.
BUDAPEST	.20	2.0	New Washed Danube Sand
ZURICH	.30	3.1	Dirty used Sand - Washed
HAGUE	.19	1.6	DUNE Sand used for Filtration
AMSTERDAM	.17	1.6	" " " " "
READING	.22	2.0	Dirty Sand Washed
PROVINCIAL BOARD OF HEALTH OF ONTARIO			
Experimental Filter D 1909-'10-'11-'12.	.26	2.0	Lake Washed Carbonate Sand - Washed
" " A.B.C & D 1909-'10.	.26	2.0	" " " " "
" " A 1911-'12	23	1.5	" " " " "
" " C 1911-12	.188	2.18	Carbonate Pit Sand - Unwashed
" " B 1911-'12	.166	1.84	Silica Sand - Unwashed.
" Mechanical Filter 1912	.39	1.6	Silica Sand - Washed.
TORONTO Dec. 31st 1912	.26	1.5	Carbonate Lake Washed Sand Bin No2
MASSACHUSETTS STATE BOARD OF HEALTH 1892			
Lawrence Experimental Station 18A.	.48	2.4	
" 36A.	.20	1.6	

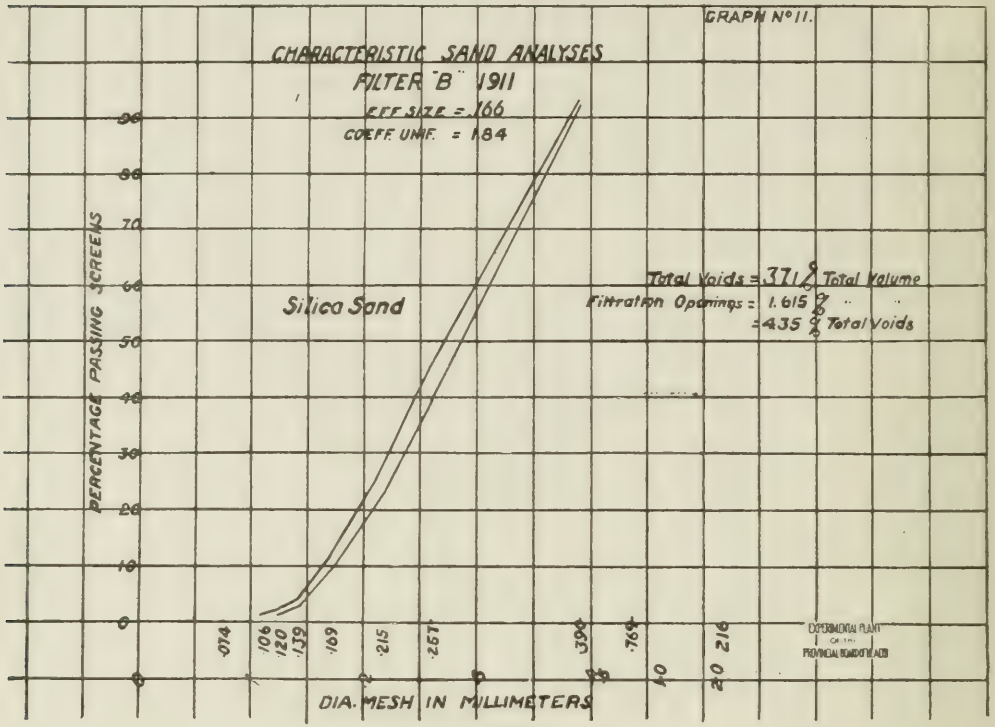
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH

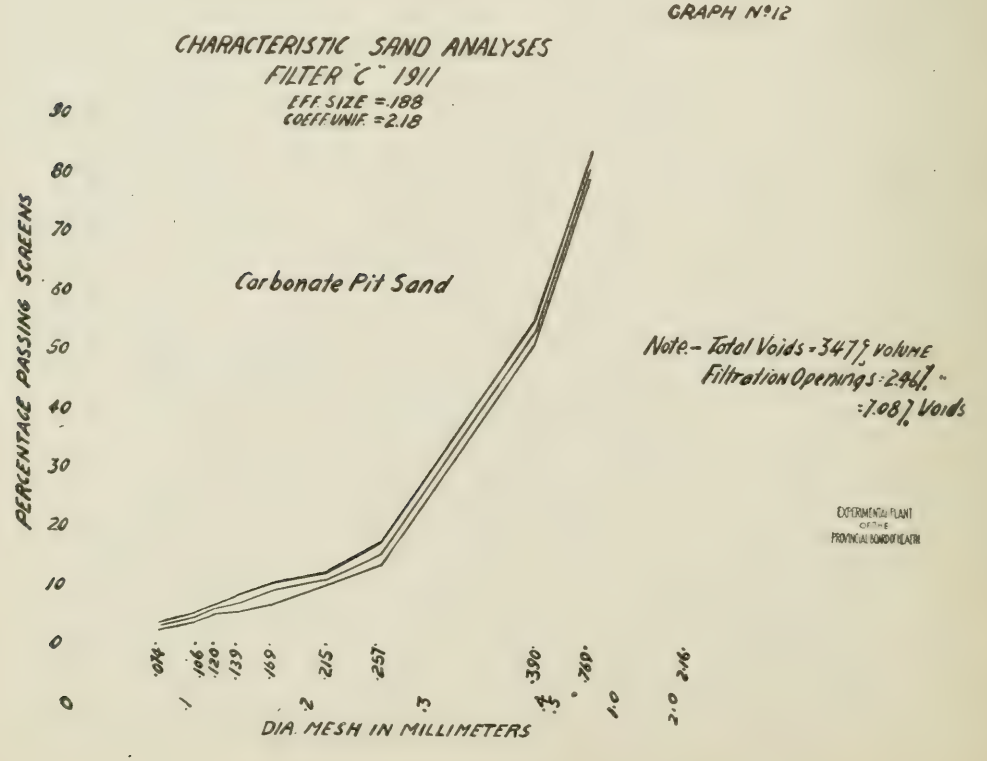
GRAPH Nº 9,

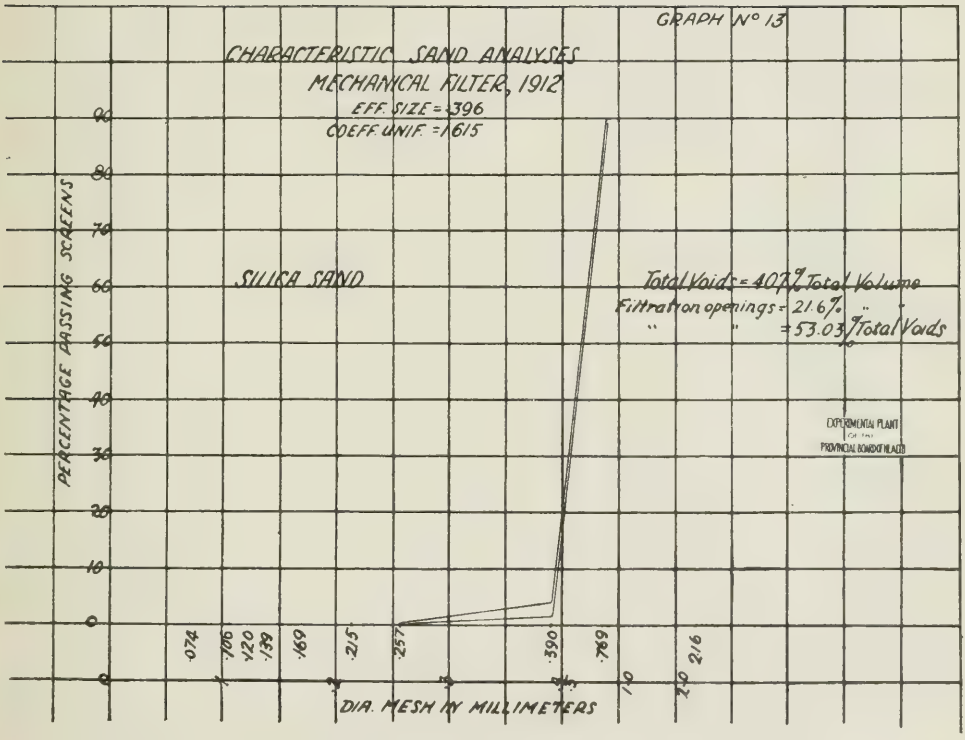

CHARACTERISTIC SAND ANALYSIS
FILTERS ABC & D. 1909, 1910
EFF. SIZE = 265 MM.
COEFF. UNIF. = 2.056
LAKE WASHED CARBONATE SAND
PERCENTAGE PASSING SCREENS
90
80
70
60
50
40
30
20
10
0
0
·074
·1
·106
·120
·139
·169
·2
·215
·257
·3
·390
·4
·5
·769
1·0
2·0
2·16
DIA. MESH IN MILLIMETERS
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH

GRAPH Nº 10


CHARACTERISTIC SAND ANALYSIS
FILTER "A" 1911
EFF. SIZE = .232
COEFF. UNIF. = 1.556
LAKE WASHED CARBONATE SAND
PERCENTAGE PASSING SCREENS
90
80
70
60
50
40
30
20
10
0
0
.074
.106
.120
.139
.169
.2
.215
.237
.3
.390
.4
.5
.769
1.0
2.0
2.16
DIA. MESH IN MILLIMETERS
EXPERIMENTAL PLANT
OF THE
PROVINCIAL BOARD OF HEALTH


GRAPH N°11.
CHARACTERISTIC SAND ANALYSES
FILTER "B" 1911
EFF. SIZE = .166
COEFF. UNIF. = 1.84
PERCENTAGE PASSING SCREENS
Silica Sand
Total Voids = 37 1/2 % Total Volume
Filtration Openings = 1.615 % " "
= 4.35 % Total Voids
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH
DIA. MESH IN MILLIMETERS


GRAPH N°12
CHARACTERISTIC SAND ANALYSES
FILTER "C" 1911
EFF. SIZE = .188
COEFF. UNIF. = 2.18
PERCENTAGE PASSING SCREENS
Carbonate Pit Sand
Note.- Total Voids = 34 7/8 % Volume
Filtration Openings = 2.46 % "
= 7.08 % Voids
EXPERIMENTAL PLANT OF THE PROVINCIAL BOARD OF HEALTH
DIA. MESH IN MILLIMETERS


GRAPH N° 13
CHARACTERISTIC SAND ANALYSES
MECHANICAL FILTER, 1912
EFF. SIZE = .396
COEFF. UNIF. = 1615
SILICA SAND
Total Voids = 40.7% Total Volume
Filtration openings = 21.6% "
" = 53.03% Total Voids
EXPERIMENTAL PLANT
PROVINCIAL BOARD OF HEALTH
PERCENTAGE PASSING SCREENS
90
80
70
60
50
40
30
20
10
0
.074
.106
.120
.139
.169
.215
.257
.390
.789
1.0
2.0
2.16
DIA. MESH IN MILLIMETERS

GRAPH No 14.

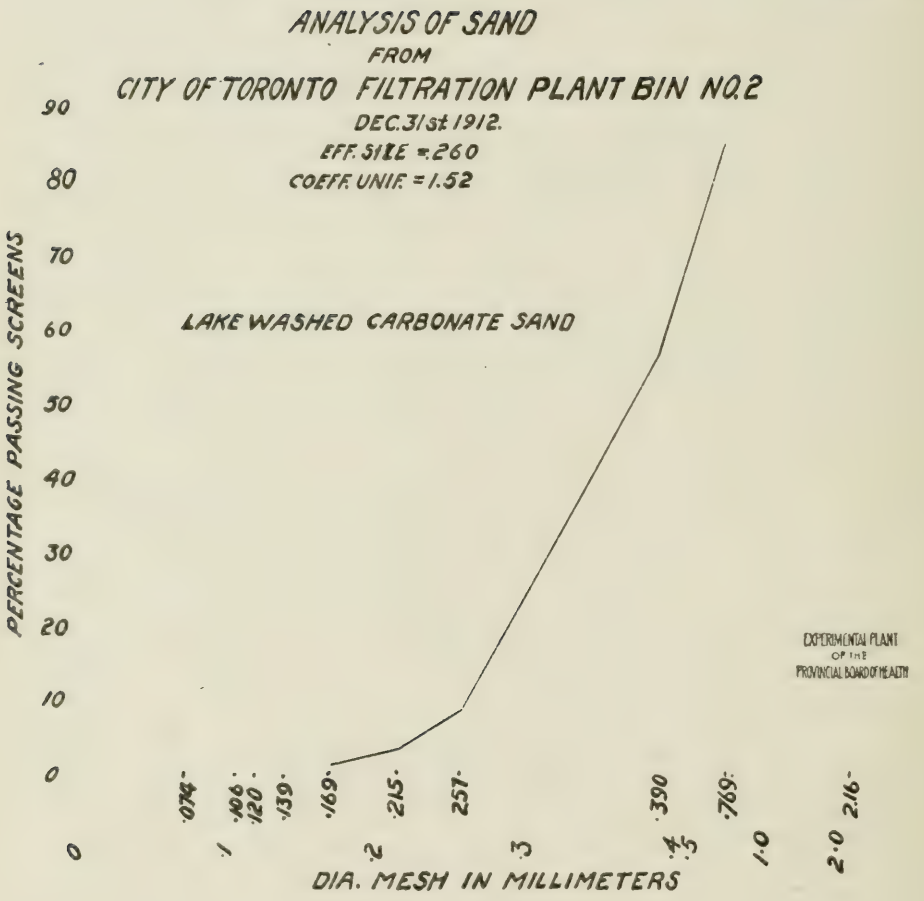

ANALYSIS OF SAND
FROM
CITY OF TORONTO FILTRATION PLANT BIN NO.2
DEC. 31st 1912.
EFF. SIZE = .260
COEFF. UNIF. = 1.52
LAKE WASHED CARBONATE SAND
EXPERIMENTAL PLANT
OF THE
PROVINCIAL BOARD OF HEALTH
PERCENTAGE PASSING SCREENS
90
80
70
60
50
40
30
20
10
0
.074
.106
.120
.139
.169
.215
.251
.390
.769
2.16
0
1
2
3
1.0
2.0
DIA. MESH IN MILLIMETERS

CHART No 4

1909–1910
TYPICAL RUNS BETWEEN SCRAPINGS, ALBANY FILTERS

	DAYS	HOURS	GALLONS	GALLONS PER ACRE	DATES
5	34	8	79335000	113335714	Oct. 12 - Nov. 15
"	53	18	119459000	170655715	Nov. 16 - Jan. 9
"	34	16	63231000	90330000	Jan. 11 - Feb. 14
"	73	4	148924000	212748571	Feb. 16 - Apr. 30
"	78	12	154128000	220182857	May 11 - Jul. 29
"	53	8	150789000	215412857	Jul. 30 - Sep. 31
6	42	8	103520000	147885714	Sep. 9 - Oct. 21
"	72	12	163108000	233011448	Oct. 22 - Jan. 3
"	62	0	175224000	250348571	Jan. 5 - Mar. 7
"	137	8	335971000	479958000	Mar. 9 - Jul 25
"	54	8	147589000	210841429	Jul. 27 - Sep 19
8	27	4	59548000	85068591	Oct. 16 - Nov. 12
"	32	8	65620000	93742857	Nov. 13 - Dec. 15
"	55	16	108947000	155638571	Dec. 16 - Feb. 10
"	34	8	65863000	94090000	Feb. 12 - Mar. 18
"	23	0	24672000	3524571 4	Mar. 19 - Apr. 12
"	40	12	68590000	97985714	Apr 13 - May 23
"	60	4	107693000	153847143	Jun. 5 - Aug. 4
"	56	10	149205000	213150000	Aug. 5 - Oct. 1
4	20	20	48859000	69798571	Oct. 20 - Nov. 10
"	21	20	43036000	61725551	Nov. 11 - Dec. 4
"	25	10	42378000	60540000	Dec. 5 - Dec. 30
"	17	0	29992000	42845714	Jan. 1 - Jan. 17
"	33	8	50417000	72024286	Jan. 20 - Feb. 22
"	48	12	88555000	126507142	Feb. 24 - Apr. 14
"	87	16	204156000	291651570	Apr. 30 - Jul. 27
"	56	12	164445000	234921428	Jul. 28 - Sep. 23
1	27	22	73641000	105201591	Sep. 26 - Oct. 25
"	99	12	245191000	350271200	Oct. 26 - Feb. 2
"	160	4	457850000	654071570	Feb. 5 - Jul. 15

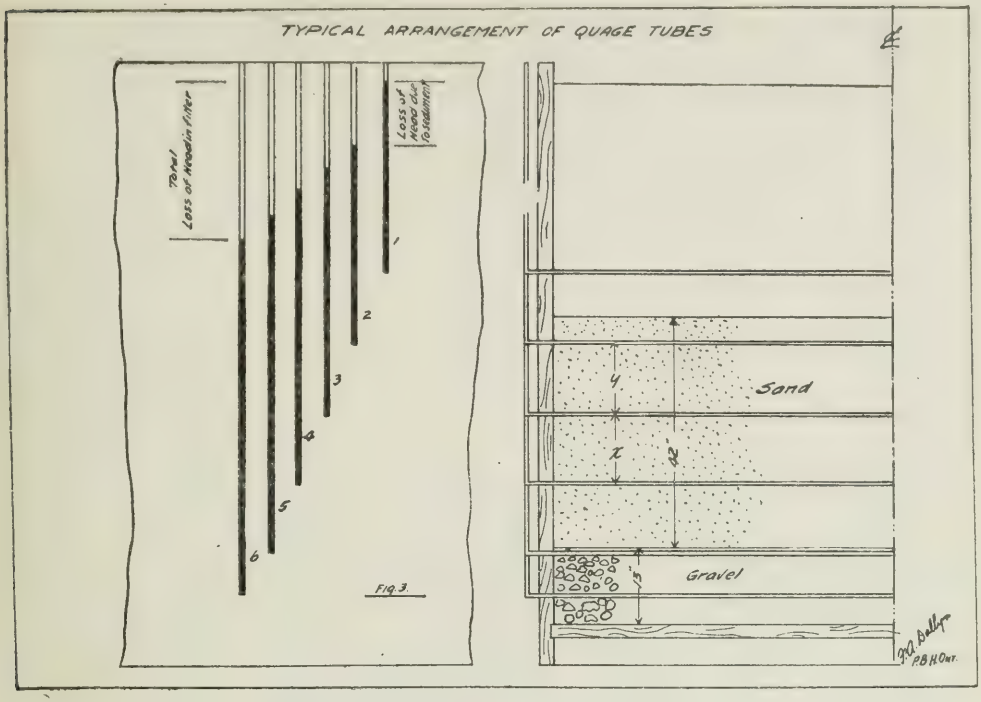
CHART Nº 5

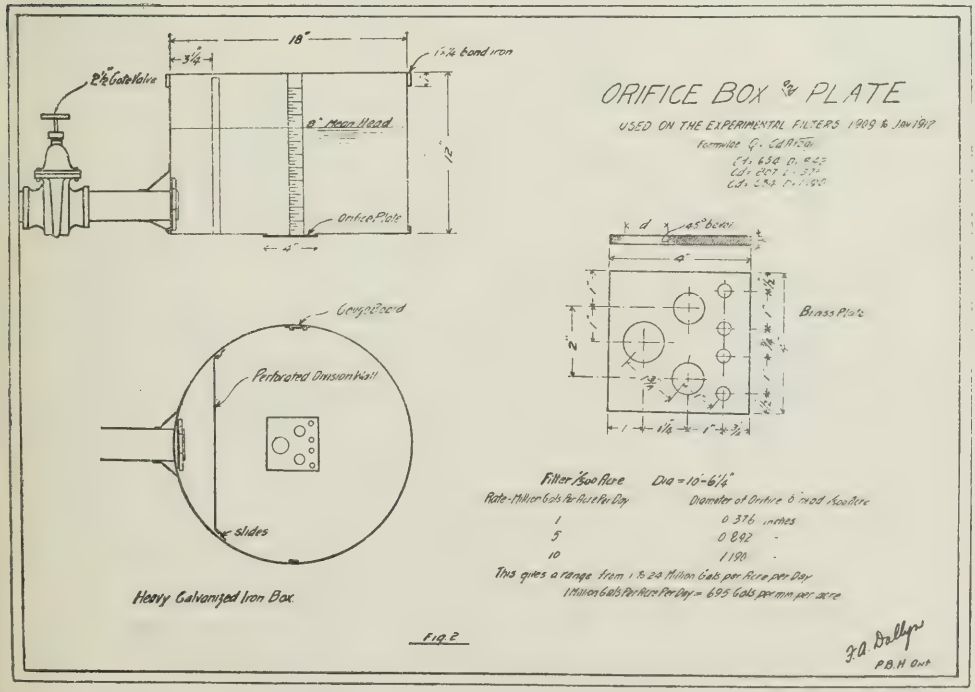
OPERATION OF ALBANY FILTERS FOR YEARS ENDING SEP 30th. 1910-1911.

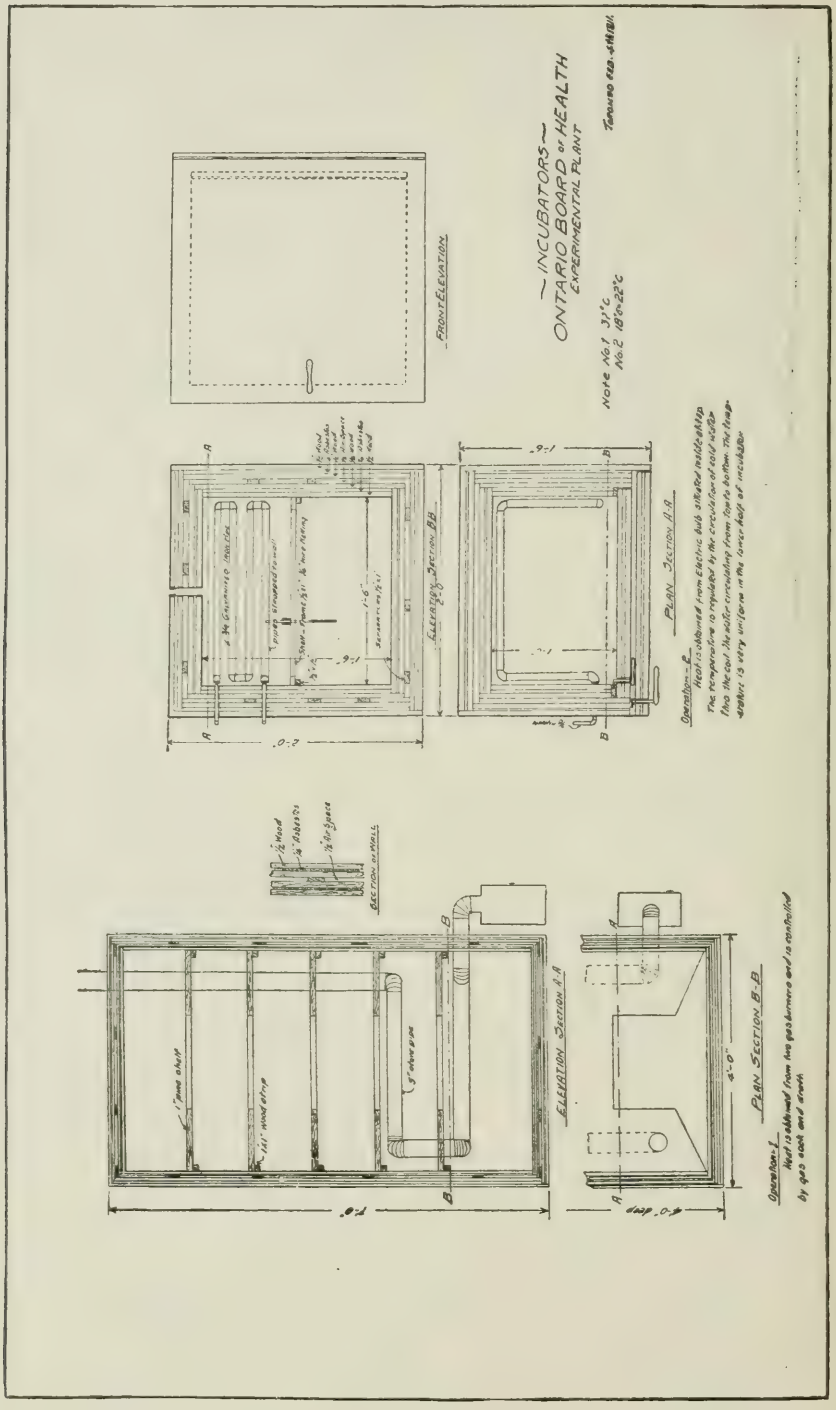
FILTER NUMBER	YEAR	TIMES SCAPER	ACTUAL HOURS SERVICE	TOTAL QUANTITY OF WATER FILTERED DURING YEAR	AVERAGE QUANTITY OF WATER FILTERED PER FILTER (07 ACRE) BETWEEN EACH SCRAPING	AVERAGE QUANTITY OF WATER FILTERED PER ACRE BETWEEN EACH SCRAPING	AVERAGE QUANTITY OF WATER FILTERED PER ACRE PER DAY
1	1910	4	8608	952 095 000	238023750	340034 000	3800000
	1911	13	8117	922 626000	70974 000	101391 000	3897000
2	1910	10	8002	650390 000	65039000	92913000	2790000
	1911	10	8557	1017914 000	101 791000	145 416 000	4079000
3	1910	5	8573	951384000	190269600	271814000	3761000
	1911	13	8481	910874000	70 067000	100096000	3682000
4	1910	10	8054	716 257000	71 625 700	123 214000	3053000
	1911	11	8455	1017327000	92484000	132120 000	4125000
5	1910	6	8166	745011 000	124168500	177 398000	3127000
	1911	11	8530	1036635000	94240000	134 629000	4167000
6	1910	5	8564	900 764 000	182152800	260218000	3330000
	1911	12	8070	917354000	76446000	109209000	3897000
7	1910	5	8604	951 506 000	190301200	271471000	3796000
	1911	12	8376	1000811000	83400000	119143000	4097000
8	1910	7	8192	673316 000	96045123	137 209000	2819000
	1911	11	8397	1026333000	93303000	147719000	4191000
TOTAL	1910	52	64763	6540 682000			
	1911	93	66983	7849869000			
AVERAGE	1910	6.5	8095	817585000	144703209	209284000	3309500
	1911	11.66	8362	981 234000	85338000	123715000	4018000

EXPERIMENTAL PLANT
ONTARIO
PROVINCIAL BOARD OF HEALTH

BUREAU OF WATER ANNUAL REPORTS 1910-1911


TYPICAL ARRANGEMENT OF QUAGE TUBES
Total Loss of Head in Filter
Loss of Head in Calibration
1
2
3
4
5
6
Sand
Gravel
4'
x
12'
3'
F.A. Dallyn
P.B.H Ont.
FIG. 3.


18"
3¼
1½ x ¾ band iron
2½" Gate Valve
8" Mean Head
12"
Orifice Plate
4"
Corrugated
Perforated Division Wall
Slides
Heavy Galvanized Iron Box
ORIFICE BOX & PLATE
USED ON THE EXPERIMENTAL FILTERS 1909 & Jan 1912
Formula Q = CdA√2gh
C1 = 638 D = 842
Cd = 607 D = 372
C3 = 587 D = 190
d
45° bevel
4"
Brass Plate
2"
1¼
1"
3½
Filter 1/500 Rate
Dia = 10-6¼"
Rate-Million Gals per Acre per Day
Diameter of Orifice 6 inches Centres
1
0.376 inches
5
0.842 "
10
1.190 "
This gives a range from 1 to 24 Million Gals per Acre per Day
1 Million Gals per Acre per Day = 695 Gals per min per acre
F.A. Dallyn
P.B.H Ont.
FIG. 2


~INCUBATORS~
ONTARIO BOARD OF HEALTH
EXPERIMENTAL PLANT
TORONTO FEB. 5TH 1891.
NOTE No.1 31°C
No.2 18°to 22°C
FRONT ELEVATION
ELEVATION SECTION A-B
PLAN SECTION A-B
ELEVATION SECTION C-D
PLAN SECTION B-B
SECTION OF SHELF
Operation-1
Heat is obtained from two gas burners and is controlled by gas cock and draft
Operation-2
Heat is obtained from electric hot water heating
The temperature is regulated by the circulation of hot water
thus the hot water circulating from top to bottom the temperature is very uniform in the lower part of incubator

APPENDIX A.

APPENDIX

SAND

TANK "A"—RATE 20,000,000 GALLONS

EXPERIMENTAL STATION.

Date	Hour A.M.	Hour P.M.	Serial No.	Gauge Read 6	Max. loss of head.	Bacterial Counts. 18°–22°C. Inf	Bacterial Counts. 18°–22°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Sept. 15....	10.20	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	10.30	.....	1	.....	.....	90	60	.....	.....	.....
	12.00	.....	2	.....	.....	120	90	.....	.....	.....
	.....	4.00	2	.....	.....	310	16	.....	.....	.....
16....	9.30	.....	4	2.45	2.45	230	25	.....	.....	.....
	12.00	.....	5	.....	.....	170	42	.....	.....	.....
	.....	4.00	6	.....	.....	70	47	.....	.....	.....
17....	9.30	.....	7	4.25	4.25	520	50	.....	.....	.....
	10.15	.....	stop	.....	.....	215	47	78.2	.....	.....
	.....	4.15	start	0.0	.....	.....	.....	.....	.....	.....
18....	9.30	.....	10	2.35	2.35	330	60	.....	.....	.....
	12.00	.....	11	.....	.....	—	—	.....	.....	.....
20....	11.00	.....	stop	3.3	3.3	330	60	81.8	.....	.....
	.....	4.00	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.15	13	.....	.....	150	20	.....	.....	.....
21....	9.30	.....	14	3.3	3.3	160	20	.....	.....	.....
	9.30	.....	stop	.....	.....	155	20	87.2	.....	.....
	.....	3.00	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	16	.....	.....	148	30	.....	.....	.....
22....	9.30	.....	17	2.55	2.55	560	10	.....	.....	.....
	12.00	.....	18	.....	.....	250	40	.....	.....	.....
	.....	4.00	19	.....	.....	680	2	.....	.....	.....
23....	9.00	.....	stop	3.3	3.3	409.5	20.5	95.1	.....	.....
	.....	12.45	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.15	22	.....	.....	400	4	.....	.....	.....
24....	9.45	.....	23	2.15	2.15	540	10	.....	.....	.....
	12.00	.....	24	.....	.....	250	10	.....	.....	.....
	.....	4.00	25	.....	.....	430	3	.....	.....	.....
25....	9.30	.....	26	3.0	3.0	390	7	.....	.....	.....
	11.30	.....	stop	3.3	3.3	402	6.8	98.3	.....	.....
	.....	3.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	28	.....	.....	299	14	.....	.....	.....
27....	9.30	.....	29	.....	.....	330	1	.....	.....	.....
	12.00	.....	30	.....	.....	610	4	.....	.....	.....
27....	.....	3.00	stop	3.2	3.2	413	6.3	98.3	.....	.....
28....	9.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	33	.....	.....	920	8	.....	.....	.....
	.....	4.00	34	.....	.....	730	19	.....	.....	.....
29....	9.30	.....	35	.....	.....	1,200	28	.....	.....	.....
	.....	4.00	36	2.85	2.85	110	6	.....	.....	.....
30....	9.30	.....	37	3.3	3.3	310	7	.....	.....	.....
	9.30	.....	stop	.....	.....	654	13.6	97.9	.....	.....
	.....	2.50	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	2.50	39	.....	.....	—	45	.....	.....	.....
	.....	3.00	40	.....	.....	—	32	.....	.....	.....
	.....	3.30	41	.....	.....	—	30	.....	.....	.....
	.....	3.45	42	.....	.....	—	25	.....	.....	.....
	.....	4.00	43	.....	.....	214	11	.....	.....	.....

A

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C

APPENDIX

SAND

TANK "A"—RATE 20,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 6	Max. loss of head.	Bacterial Counts. 18°22°C Inf.	Bacterial Counts. 18°22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Oct. 1.....	9.30	.....	44	.....	.....	280	3	.....	.....	.....
	12.00	.....	48	.....	.....	120	9	.....	.....	.....
	.....	4.00	49	3.0	3.0	76	5	.....	.....	.....
2.....	9.30	.....	50	.....	.....	380	4	.....	.....	.....
	10.50	.....	stop	3.3	3.3	214	6.4	96.8	.....	.....
	.....	1.00	start	0.0	0.0	.....	.....	.....	.....	.....
4.....	12.00	.....	52	.....	.....	140	7	.....	.....	.....
	12.00	.....	stop	3.3	3.3	140	7	95.1	.....	.....
	.....	4.45	start	0.0	0.0	.....	.....	.....	.....	.....
5.....	9.30	.....	54	2.15	2.15	200	2	.....	.....	.....
	12.00	.....	55	2.25	2.25	112	7	.....	.....	.....
5.....	.....	4.00	56	2.15	2.15	173	5	.....	.....	.....
6.....	9.30	.....	57	2.1	2.1	440	4	.....	.....	.....
	12.00	.....	58	2.1	2.1	230	4	.....	—	—
	.....	4.00	59	2.3	2.3	260	6	.....	+	+
7.....	9.30	.....	60	2.9	2.9	270	5	.....	+	+
	12.00	.....	61	3.0	3.0	220	4	.....	+	+
	.....	3.00	stop	3.3	3.3	265.5	6.1	97.8	.....	.....
8.....	10.15	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	64	2.9	2.9	290	30	.....	—	+
	.....	4.00	65	2.75	2.73	940	20	.....	+	+
9.....	9.30	.....	66	2.3	2.3	200	7	.....	.....	.....
	12.00	.....	67	2.85	2.85	400	7	.....	+	+
11.....	9.30	.....	68	2.75	2.75	560	1	.....	—	—
	12.00	.....	69	2.85	2.85	150	1	.....	—	+
	.....	4.00	70	3.05	3.05	89	10	.....	—	+
12.....	7.00	.....	stop	3.3	3.3	374.2	10.8	97.7		
	.....	12.45	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	73	2.2	2.2	157	0	.....	+	+
13.....	9.30	.....	74	1.9	1.9	151	4	.....	—	+
	12.00	.....	75	1.9	1.9	134	10	.....	+	+
	.....	4.00	76	1.8	1.8	151	3	.....	+	+
14.....	9.30	.....	77	2.0	2.0	200	5	.....	—	+
	12.00	.....	78	2.05	2.05	148	1	.....	—	+
	.....	4.00	79	2.1	2.1	150	3	.....	—	+
15.....	9.30	.....	80	2.5	2.5	151	5	.....	.....	.....
	12.00	.....	81	2.7	2.7	1520.	140.	.....	.....	.....
	.....	4.00	82	3.1	3.1	240.	0	.....	.....	.....
	.....	5.00	stop	3.3	3.3	290.2	17.1	94.1		
16.....	.....	12.30	start	0.0	0.0	.....	.....	.....	.....	.....
18.....	12.00	.....	85	2.7	2.7	220	3	.....	.....	.....
	.....	3.30	86	2.7	2.7	129	6	.....	.....	.....
19.....	9.30	.....	87	3.6	3.6	160	5	.....	.....	.....
	9.30	.....	stop	.....	.....	169.6	4.6	97.4		
	.....	3.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	89	3.0	3.0	460	5	.....	.....	.....
20.....	9.30	.....	90	2.15	2.15	1700	4	.....	.....	.....
	12.00	.....	91	2.15	2.15	1200	4	.....	.....	.....

A—Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
—	—	+	+	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	+	+	+	—	+	—	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
+	+	+	+	+	+	—	+	—	—	+	+	+	+
+	+	+	+	+	+	—	+	—	—	+	+	+	+
+	+	+	+	+	+	—	—	+	—	+	+	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	—
+	+	+	+	+	+	+	—	—	+	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	—	+	+	+	+	—	+	+	—	—	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	—	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	—	+	+	+	+

APPENDIX
SAND

EXPERIMENTAL STATION. TANK "A"—RATE 20,000,000 GALLONS

Date. 1909	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 6	Max. loss of head.	Bacterial Counts. 18°22°C Inf.	Bacterial Counts. 18°22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
	.....	4.00	92	2.35	2.35	3460	300	.....	.....	.....
21.....	9.30	.....	stop	3.7	3.7	1705	78.2	95.4		
26.....	.....	3.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	96	2.5	2.5	160	9	.....	—	+
27.....	9.30	.....	97	2.4	2.4	91	1	.....	—	+
	12.00	.....	98	2.3	2.3	60	4	.....	—	+
	.....	4.00	99	2.2	2.2	40	5	.....	+	—
28.....	12.00	.....	100	2.2	2.2	35	3	.....	—	+
	.....	3.00	101	2.35	2.35	60	3	.....	.....	.....
29.....	.....	3.00	102	3.15	3.15	60	80	.....	—	+
	.....	3.00	stop	.....	.....	72.2	15	98.3		
30.....	12.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
Nov. 1.....	9.30	.....	105	2.2	2.2	130	5	.....	.....	.....
	12.00	.....	106	2.35	2.35	60	12	.....	.....	.....
	.....	3.00	107	2.6	2.6	30	4	.....	.....	.....
2.....	10.00	.....	stop	3.3	3.3	73.3	7	90.4		
5.....	9.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	9.30	.....	109	.....	.....	70	2	.....	.....	.....
	12.00	.....	110	2.6	2.6	60	7	.....	.....	.....
	.....	3.00	111	2.55	2.55	35	5	.....	.....	.....
Nov. 6....	9.30	.....	112	1.8	1.8	40	3	.....	.....	.....
	12.00	.....	113	1.8	1.8	110	6	.....	.....	.....
8....	12.00	.....	114	2.7	2.7	55	9	.....	.....	.....
	.....	4.00	115	3.0	3.0	85	5	.....	.....	.....
9....	9.30	.....	stop	3.3	3.3	65	5.2	92.0	.....	.....
	.....	3.45	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	118	2.8	2.8	65	40	.....	.....	.....
10....	9.30	.....	stop	3.3	3.3	65	40	38.5	.....	.....
	.....	3.00	start	0.0	0.0	.....	.....	.....	.....	.....
10....	.....	3.00	121	3.0	3.0	65	1	.....	—	—
11....	9.30	.....	122	2.8	2.8	80	9	.....	—	—
	12.00	.....	123	3.05	3.05	50	0	.....	—	—
	.....	3.30	124	3.6	3.6	35	0	.....	—	—
	.....	4.00	stop	3.6	3.6	57.5	2.5	95.6	.....	.....
12....	12.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	3.00	126	2.6	2.6	125	40	.....	—	—
13....	9.30	.....	127	2.05	2.05	85	13	.....	—	—
	12.00	.....	128	2.2	2.2	90	5	.....	—	—
15....	9.30	.....	stop	3.3	3.3	100	19.3	80.7	.....	.....
23....	9.45	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	10.00	.....	142	0.8	0.8	1,420	50	.....	+	+
	12.00	.....	143	0.8	0.8	3,210	30	.....	+	+
	.....	3.30	144	0.8	0.8	2,380	60	.....	+	+
24....	9.30	.....	145	0.7	0.7	5,600	227	.....	+	+
	12.00	.....	146	1.3	1.3	1,030	10	.....	+	+
	.....	3.00	stop	.....	.....	2,728	75.4	97.2		
Dec. 6....	.....	4.30	start	.....	.....	.....	.....	.....	.....	.....
	.....	4.30	158	.....	.....	—	—	.....	.....	.....
7....	9.30	.....	stop	.....	.....	.....	.....	.....	.....	.....

New Sand placed in February

A—Continued.
FILTERS.
PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	+	+	+	+	+	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	+	—	+	+	—	+	+
+	+	+	+	+	+	—	—	+	+	+	—	—	—
+	+	+	+	+	+	—	+	+	+	+	+	+	+
—	—	—	+	+	+	—	—	—	—	—	—	—	+
+	+	+	—	—	—	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
+	+	—	+	+	+	—	+	—	—	+	—	—	—
—	+	+	+	+	—	—	—	—	—	+	—	+	+
—	—	—	—	—	—	—	—	—	—	+	—	—	—
+	+	+	+	+	—	—	—	—	+	+	—	+	—
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+

20 cu. yds. received Jan. 28, 1910.

APPENDIX A—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Feb. 16....	.....	4.00	162	452	320	.....	.....	.....	0	+
17....	10.00	.....	163	215	70	.....	.....	.....	+	+
	12.00	.....	164	290	30	.....	.....	.....	0	+
	.....	4.00	165	670	41	.....	.....	.....	+	+
18....	10.00	.....	166	760	152	.....	.....	.....	—	+
	12.00	.....	167	540	82	.....	.....	.....	0	+
	.....	4.00	168	940	84	.....	.....	.....	+	+
	.....	5.00	stop	725.5	111	.....	.....	84.7		
21....	12.00	.....	start	.....	.....	.....	.....	.....	.....	.....
	12.00	.....	172	62	25	.....	.....	.....	0	0
	.....	4.00	173	385	12	.....	.....	.....	+	+
22....	10.00	.....	174	35	12	.....	.....	.....	0	0
	12.00	.....	175	475	4	.....	.....	.....	+	+
	.....	3.00	176	4,110	14	23 10	1 1	.....	+	+
23....	10.00	.....	177	290	15	.....	.....	.....	+	+
	12.00	.....	178	155	28	.....	.....	.....	+	+
	.....	4.00	179	110	54	1 0	1 1	.....	0	+
24....	10.00	.....	180	55	17	.....	.....	.....	+	+
	12.00	.....	181	72	8	.....	.....	.....	0	0
	.....	4.00	182	14	50	1 0	1 1	.....	+	+
25....	10.00	.....	183	42	40	.....	.....	.....	0	0
	12.00	.....	184	20	30	.....	.....	.....	0	+
	.....	4.00	185	22	48	.....	.....	.....	0	0
26....	9.30	.....	186	75	47	0 0	0 0	.....	0	0
	11.00	.....	187	120	21	.....	.....	.....	0	0
28....	10.00	.....	188	30	32	.....	.....	.....	0	+
	12.00	.....	189	30	12	.....	.....	.....	0	0
	.....	4.00	190	320	9	3 3	0 0	.....	—	—

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	0	+	+	+	+	+	+	+
+	+	+	+	+	+	0	+	+	+	+	+	+	+
+	+	+	+	+	+	0	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	.....	.....	.....	+	+	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	—	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	0	—	0	+	.....	.....	.....
0	0	0	.....	.....	.....	0	0	+	0	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	0	—	+	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	—	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	—	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	—	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	0	+	.....	.....	.....
0	—	—	.....	.....	.....	0	+	+	+	+	.....	.....	.....
—	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	0	+	0	.....	.....	.....
—	+	+	.....	.....	.....	—	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	0	—	0	+	.....	.....	.....
0	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
0	0	+	.....	.....	.....	0	0	0	+	+	.....	.....	.....
0	0	0	.....	.....	.....	0	+	+	+	0	.....	.....	.....
0	0	0	.....	.....	.....	0	+	0	0	—	.....	.....	.....
+	+	+	.....	.....	.....	0	—	0	+	+	.....	.....	.....

APPENDIX A—
SAND
TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date 1910	Hour. A M.	Hour. P,M.	Serial No.	Gauge Read. 1	2	3	4	5	6	Max loss of head.	Bacterial Counts. 18°-22°C Inf.	18°-22°C Eff.	37.5°C Inf.	37.5°C Eff.	Bact. Eff'cy.
March 1....	10.00	.....	191	...	...	...	...	...	...	...	2,710	136	.....	.....	.....
	12.00	.....	192	...	...	...	...	...	...	...	1,250	236	.....	.....	.....
	.....	4.00	193	...	...	...	...	...	...	...	380	340	4 0	0 0	.....
2....	10.00	.....	194	...	...	...	...	...	...	...	1,350	462	.....	.....	.....
	12.00	.....	195	...	...	...	...	...	...	...	720	157	.....	.....	.....
	.....	4.00	196	...	...	...	...	...	...	...	340	85	0 0	0 0	.....
3....	10.00	.....	197	...	...	...	...	...	...	...	560	53	.....	.....	.....
	12.00	.....	198	...	...	...	...	...	...	...	390	22	.....	.....	.....
	.....	4.00	199	...	...	...	...	...	...	...	210	22	0 0	0 0	.....
4....	10.00	.....	200	...	...	...	...	...	...	...	4,100	860	.....	.....	.....
	12.00	.....	201	...	...	...	...	...	...	...	4,900	620	.....	.....	.....
	.....	4.00	202	...	...	...	...	...	...	...	5,200	550	14 0	3 1	.....
5....	10.00	.....	203	...	...	...	...	...	...	...	790	590	.....	.....	.....
7....	10.00	.....	204	...	...	...	...	...	...	...	495	360	.....	.....	.....
	10.30	.....	stop	...	...	...	...	...	...	...	903.5	150.6	5.1 1.4	.66 .44	83.3
8....	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	87%	.....
														69.2%	.....
9....	10.00	.....	209	1.4	1.4	1.0	.8	.4	.2	1.2	3,980	358	.....	.....	.....
	12.00	.....	210	1.4	1.4	1.0	.8	.4	.2	1.2	2,120	252	.....	.....	.....
	.....	4.00	211	1.2	1.2	.9	.7	.2	.2	1.0	2,130	215	21 1	6 2	.....
10....	10.00	.....	212	1.2	1.2	.8	.6	.2	.2	1.0	2,010	227	.....	.....	.....
	12.00	.....	213	1.2	1.2	.8	.6	.2	.2	1.0	3,500	184	.....	.....	.....
	.....	4.00	214	1.2	1.2	.8	.6	.2	.2	1.0	1,190	209	25 0	1 1	.....
11....	10.00	.....	215	1.1	1.1	.8	.5	.3	.2	0.9	780	143	.....	.....	.....
	12.00	.....	216	1.1	1.1	.8	.5	.4	.2	0.9	390	178	.....	.....	.....
	.....	4.00	217	1.1	1.1	.8	.6	.3	.2	0.9	1,070	90	4 0	3 0	.....
12....	10.00	.....	218	1.1	1.1	.8	.6	.4	.2	0.9	300	63	.....	.....	.....
	12.00	.....	219	1.1	1.1	.8	.6	.4	.2	0.9	390	19	.....	.....	.....
14....	10.00	.....	220	1.1	1.1	1.0	.8	.5	.2	0.9	500	42	.....	.....	.....
	12.00	.....	221	1.1	1.1	.9	.8	.4	.2	0.9	150	20	.....	.....	.....
14....	.....	4.00	222	1.1	1.1	1.0	.9	.5	.2	0.9	156	27	24 2	9 0	.....
15....	10.00	.....	223	1.2	1.2	1.0	.9	.7	.2	1.0	760	15	.....	.....	.....
	12.00	.....	224	1.1	1.1	.9	.8	.7	.2	0.9	1.070	147	.....	.....	.....
	.....	4.00	225	1.1	1.1	1.0	.8	.7	.2	0.9	1,430	127	18 1	6 2	.....
16....	10.00	.....	226	1.2	1.2	1.0	.9	.7	.2	1.0	210	31	.....	.....	.....
	12.00	.....	227	1.2	1.2	1.0	.9	.7	.2	1.0	250	26	.....	.....	.....
	.....	4.00	228	1.2	1.2	1.1	1.0	.8	.2	1.0	262	32	10 1	3 0	.....
17....	10.00	.....	229	1.2	1.2	1.1	1.0	.8	.2	1.0	90	15	.....	.....	.....
	12.00	.....	230	1.3	1.3	1.1	1.0	.9	.2	1.1	360	22	.....	.....	.....
	.....	4.00	231	1.3	1.3	1.2	1.1	.8	.2	1.1	3,200	21	38 3	3 0	.....
18....	10.00	.....	232	1.4	1.4	1.3	1.3	.9	.2	1.2	920	54	.....	.....	.....
	12.00	.....	233	1.4	1.4	1.3	1.2	1.0	.2	1.2	279	4	.....	.....	.....
	.....	4.00	234	1.4	1.4	1.3	1.2	.9	.2	1.2	610	33	6 0	4 1	.....
19....	10.00	.....	235	1.5	1.5	1.4	1.4	1.0	.2	1.3	850	13	.....	.....	.....
21....	10.00	.....	236	1.7	1.7	1.6	1.5	1.2	.2	1.5	250	8	.....	.....	.....
	12.00	.....	237	1.7	1.7	1.6	1.5	1.3	.2	1.5	960	4	.....	.....	.....
	.....	4.00	238	1.9	1.9	1.8	1.7	1.5	.2	1.7	500	8	14 0	2 0	.....
22....	10.00	.....	239	2.0	2.0	1.9	1.9	1.6	.2	1.8	80	9	.....	.....	.....
	12.00	.....	240	2.1	2.1	2.0	1.9	1.7	.2	1.9	55	8	.....	.....	.....
	.....	4.00	241	2.2	2.2	2.1	2.0	1.8	.2	2.0	64	4	8 0	2 0	.....
23....	10.00	.....	242	2.5	2.5	2.4	2.3	2.1	.2	2.3	200	11	.....	.....	.....
	12.00	.....	243	2.4	2.4	2.3	2.2	2.0	.2	2.2	120	4	.....	.....	.....
	.....	4.00	244	2.4	2.4	2.3	2.2	2.0	.2	2.2	70	10	6 0	0 0	.....
29....	9.00	.....	stop	...	...	...	...	...	...	...	868	73	.....	.....	91.6
Apr. 4....	10.30	.....	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	12.00	.....	245	...	...	...	...	...	...	...	138	105	.....	.....	.....
	.....	4.00	246	...	...	...	...	...	...	...	142	24	.....	.....	.....
5....	10.00	.....	247	...	...	...	...	...	...	...	96	10	.....	.....	.....
	12.00	.....	248	...	...	...	...	...	...	...	180	4	.....	.....	.....

Continued.
FILTERS.
PER ACRE PER DAY.

Colon Bacilli.

Influent.							Effluent.						
C.C. 1	C.C. 5	C.C. 10	C.C. 15	C.C. 20	C.C. 30	C.C. 40	C.C. 1	C.C. 5	C.C. 10	C.C. 15	C.C. 20	C.C. 30	C.C. 40
0	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
+	0	0	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	0	0	0	.....	.....	—	—	+	+	+	.....	.....
0	+	+	—	+	.....	.....	—	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	0	0	+	.....	.....	0	+	0	+	+	.....	.....
0	0	0	0	0	.....	.....	0	0	0	+	+	.....	.....
0	0	0	+	+	.....	.....	0	0	+	+	0	.....	.....
0	+	0	+	+	.....	.....	0	0	0	0	+	.....	.....
+	+	+	+	+	.....	.....	—	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	—	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	+	—	+	+	.....	.....	—	+	—	+	+	.....	.....
0	+	+	—	0	.....	.....	0	0	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	0	0	+	0	.....	.....
0	+	+	+	+	.....	.....	0	+	0	—	+	.....	.....
+	0	+	+	+	.....	.....	0	0	+	—	+	.....	.....
+	+	—	+	+	.....	.....	0	+	+	0	+	.....	.....
0	0	0	+	+	.....	.....	0	0	0	+	+	.....	.....
0	0	+	+	+	.....	.....	0	0	0	+	0	.....	.....
0	0	0	+	+	.....	.....	0	+	0	0	+	.....	.....
0	0	+	+	+	.....	.....	0	+	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....
+	+	+	+	+	.....	.....	+	0	+	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	0	0	—	+	+	.....	.....
+	+	+	+	+	.....	.....	0	—	—	+	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	0	+	+	+	.....	.....
0	+	—	+	+	.....	.....	0	—	0	0	+	.....	.....
0	0	+	+	+	.....	.....	0	0	+	+	+	.....	.....
0	+	+	+	+	.....	.....	0	0	0	0	+	.....	.....
0	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
0	+	+	0	+	.....	.....	0	+	0	0	0	.....	.....
+	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	0	.....	.....
0	+	0	+	+	.....	.....	0	0	0	0	0	.....	.....
0	+	+	+	+	.....	.....	0	+	0	0	0	.....	.....
+	+	+	+	+	.....	.....	0	0	0	—	+	.....	.....
0	0	+	+	+	.....	.....	0	0	0	0	+	.....	.....
+	+	+	+	+	.....	.....	0	+	0	0	0	.....	.....
+	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
0	0	—	0	+	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....
0	0	0	—	0	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	—	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	—	.....	.....	0	0	0	0	—	.....	.....
0	0	+	—	+	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	—	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....

APPENDIX A—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Apr. 5....	.....	4.00	249	47	2	.....	.....	.....	0	0
6....	10.00	.....	250	30	4	.....	.....	.....	0	0
	12.00	.....	251	12	12	.....	.....	.....	0	0
	.....	4.00	252	15	6	.....	.....	.....	0	0
7....	10.00	.....	253	240	3	.....	.....	.....	—	+
	12.00	.....	254	80	5	.....	.....	.....	0	+
	.....	4.00	255	35	0	.....	.....	.....	0	0
8....	10.00	.....	256	87	5	.....	.....	.....	0	0
	12.00	.....	257	28	2	.....	.....	.....	0	0
	.....	4.00	258	38	4	.....	.....	.....	0	0
9....	10.00	.....	259	3	0	.....	.....	.....	0	+
	12.00	.....	260	0	0	.....	.....	.....	0	0
	.....	1.00	stop	73.2	11.6			84.1		

Chlorine being added

May 4....	.....	4.00	269	80	1	3	1	.....	.....	.....
5....	10.00	.....	270	11	8	7	7	.....	.....	.....
	12.00	.....	271	51	2	11	2	.....	.....	.....
	.....	4.00	272	108	4	6	4	.....	.....	.....
6....	10.00	.....	273	162	19	29	6	.....	.....	.....
	12.00	.....	274	222	25	48	9	.....	.....	.....
	.....	4.00	275	117	12	12	4	.....	.....	.....
7....	10.00	.....	276	19	5	350	4	.....	.....	.....
	12.00	.....	277	25	6	18	5	.....	.....	.....
9....	10.00	.....	278	230	4	30	2	.....	.....	.....
	12.00	.....	279	87	2	22	2	.....	.....	.....
	.....	4.00	280	53	5	60	11	.....	.....	.....
10....	10.00	.....	281	86	9	15	4	.....	.....	.....
	12.00	.....	280	80	2	8	5	.....	.....	.....
	.....	4.00	282	108	7	31	9	.....	.....	.....
11....	10.00	.....	284	17	0	14	10	.....	.....	.....
	12.00	.....	285	149	4	22	6	.....	.....	.....
	.....	4.00	286	38	9	480	2	.....	.....	.....
12....	10.00	.....	287	172	8	23	2	.....	.....	.....
	12.00	.....	288	158	2	16	23	.....	.....	.....
	.....	4.00	289	30	4	8	1	.....	.....	.....
13....	10.00	.....	290	100	7	18	3	.....	.....	.....
	12.00	.....	291	86	8	65	2	.....	.....	.....
	.....	4.00	292	86	6	20	4	.....	.....	.....
14....	10.00	.....	293	.....	1	.....	0	.....	.....	.....
	12.00	.....	294	60	1	24	4	.....	.....	.....
16....	10.00	.....	295	106	3	60	3	.....	.....	.....
	12.00	.....	296	30	1	21	3	93.7	.....	.....
				91.5	5.9	22.2	4.9	78.0		
May 21....	12.00	.....	297	147	3	14	4	.....	.....	.....
25....	10.00	.....	298	12	0	7	0	.....	.....	.....
	12.00	.....	299	22	0	45	0	.....	.....	.....
	.....	4.00	300	15	0	13	2	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0	0	0	.....	.....	.....	0	0	0	0	0	.....	.....	.....
0	0	0	.....	.....	.....	0	0	0	0	0	.....	.....	.....
+	+	0	.....	.....	.....	0	0	0	0	0	.....	.....	.....
0	0	0	.....	.....	.....	0	0	0	0	0	.....	.....	.....
+	+	+	.....	.....	.....	0	0	0	0	0	.....	.....	.....
+	+	+	.....	.....	.....	0	0	0	0	0	.....	.....	.....
0	0	0	0	—	.....	0	0	0	0	0	.....	0	.....
0	0	0	.....	0	.....	.....	.....	0	0	0	.....	0	.....
0	0	0	.....	0	.....	.....	.....	0	0	0	.....	0	.....
0	0	0	.....	0	.....	.....	.....	0	0	0	.....	0	.....
+	+	+	.....	+	.....	.....	.....	0	0	0	.....	0	.....
0	0	0	.....	0	.....	.....	.....	0	0	0	.....	0	.....

by city at island.

.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX A—

SAND

TANK "A"—RATE 5,00,0000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910 May 26....	10.00	.....	301	25	0	8	0	98.75	.....	.....
				44.2	.6	15.4	1.2	92.2		
30....	10.00	.....	302	66	5	10	1	.....	.....	.....
	12.00	.....	303	45	2	19	3	.....	.....	.....
	.....	4.00	304	21	2	15	2	.....	.....	.....
31....	10.00	.....	305	65	2	10	4	.....	.....	.....
	12.00	.....	306	62	2	60	5	.....	.....	.....
	.....	4.00	307	55	3	9	2	.....	0	0
June	10.00	.....	308	80	4	6	0	.....	.....	.....
	12.00	.....	309	58	4	4	1	.....	.....	.....
	.....	4.00	310	100	3	8	1	.....	0	0
....	10.00	.....	311	45	1	4	2	.....	.....	.....
	12.00	.....	312	36	1	6	1	.....	.....	.....
	.....	4.00	313	50	0	6	4	.....	0	0
3....	10.00	.....	314	90	3	6	3	.....	.....	.....
	12.00	.....	315	72	3	5	2	.....	.....	.....
	.....	4.00	316	26	1	5	7	.....	0	0
4....	10.00	.....	317	40	4	15	3	.....	.....	.....
	12.00	.....	318	1,440	3	40	3	98.2	0	—
				138.1	2.53	13.4	2.59	80.75		
6....	.....	4.00	319	45	2	30	1	.....	0	0
7....	10.00	.....	320	100	0	8	1	.....	.....	.....
	12.00	.....	321	140	2	9	3	.....	.....	.....
	.....	4.00	322	28	1	2	3	.....	0	0
8....	10.00	.....	323	150	0	4	1	.....	.....	.....
	12.00	.....	324	180	4	10	0	.....	.....	.....
	.....	4.00	325	340	6	11	2	.....	0	0
9....	10.00	.....	326	180	9	5	2	.....	.....	.....
	12.00	.....	327	55	4	5	2	.....	.....	.....
	.....	4.00	328	45	0	8	3	.....	0	0
10....	10.00	.....	329	170	10	14	0	.....	.....	.....
11....	10.00	.....	330	45	2	1	—	.....	.....	.....
	12.00	.....	331	100	0	6	0	.....	0	—
13....	10.00	.....	332	500	2	85	7	.....	.....	.....
	12.00	.....	333	95	3	8	8	.....	.....	.....
	.....	4.00	334	110	14	15	0	.....	0	0
14....	10.00	.....	335	90	7	6	2	.....	0	0
	12.00	.....	336	36	2	7	6	9.72	0	0
	stop	and clea	ned	133.8	3.7	.....	.....	.....		
	.....	4.00	337	50	5	2	1	.....	0	0
15....	10.00	.....	338	35	4	5	1	.....	0	0
	12.00	.....	339	33	3	1	0	.....	0	0
16....	10.00	.....	340	50	4	2	2	.....	+	+
	12.00	.....	341	66	5	0	0	.....	0	0
	.....	4.09	342	58	1	6	3	.....	0	+
17....	10.00	.....	343	84	8	5	0	.....	0	0
	12.00	.....	344	80	15	5	4	.....	0	0
	.....	4.00	345	130	17	5	4	88.1	0	—
18....	10.00	.....	346	53	14	1	3	95.9	0	0
				64.0	1.6	10.2	2.18	7.86		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
					—								0
0		0			—								0
—		0			—								0
0		0			0								0
0		—			—								0
0		+			+								0
—		—			—								0
0		0			—								0
0		+			+								0
0		0			—								0
—		+			+								0
0		0			0								0
0		0			0								0
0		0			0								0
0		0			9								0
0		0			0								0
0		0			0								0
+		+											0
0		0			0								0
0		0			+								0
0		0			0								0
0		0			0								0
0		+			+								0
0		0			+								0

APPENDIX A—
SAND
TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910 June 21....				Strips added to filters two men in tank					sand t hrown	
	.....	4.00	347	110	46	5	8		0	0
22....	10.00	.....	348	16	20	12	3		0	0
	12.00	.....	349	35	48	5	5		0	0
	.....	4.00	350	46	20	28	4		+	0
23....	10.00	.....	351	75	250	3	2		0	0
	12.00	.....	352	45	230	12	3		0	0
	.....	4.00	353	30	350	18	2		0	0
24....	10.00	.....	354	34	400	17	2		0	0
	12.00	.....	355	110	320	8	7		0	+
	.....	4.00	356	51	250	8	0		0	0
25....	10.00	.....	357	20	63	7	17		0	0
	12.00	.....	358	26	60	5	0		0	0
27....	10.00	.....	359	37	16	3	1		0	0
	12.00	.....	360	23	48	1	5		0	—
	.....	4.00	361	40	25	3	1		0	0
28....	10.00	.....	362	52	13	6	3		0	0
	12.00	.....	363	16	12	1	1		0	+
	.....	4.00	364	14	4	10	1		0	0
29....	10.00	.....	365	16	9	0	1		0	0
	12.00	.....	366	21	15	0	1		0	—
	.....	4.00	367	—	—	2	1		0	—
30....	10.00	.....	368	7	7	3	1		—	0
	12.00	.....	369	7	6	2	3		+	—
	.....	4.00	370	15	2	3	0		0	—
July 4....	12.00	.....	371	145	60	66	1		+	+
	.....	4.00	372	32	4	1	7		—	+
5....	10.00	.....	373	145	11	45	3		—	+
	12.00	.....	374	400	8	90	5		—	+
	.....	4.00	375	190	5	30	3		0	+
6....	10.00	.....	376	430	8	23	2		0	+
	12.00	.....	377	140	7	3	3		0	—
	.....	4.00	378	18	4	9	1		—	—
7....	10.00	.....	379	175	3	33	3		0	+
	12.00	.....	380	110	4	3	1		—	—
	.....	4.00	381	90	2	3	3		0	+
8....	10.00	.....	382	42	8	6	0		0	0
	12.00	.....	383	50	5	3	3		0	—
	.....	4.00	384	44	14	21	1		0	0
9....	10.00	.....	385	28	14	1	0		0	0
	12.00	.....	386	325	4	165	2		+	+
11....	12.00	.....	387	115	13	4	5		0	+
	.....	4.00	388	110	12	4	2		0	—
12....	10.00	.....	389	80	—	9	1		0	0
	12.00	.....	390	94	7	12	1		—	—
	.....	4.00	391	31	2	6	5		0	+
13....	10.00	.....	392	28	5	3	3		—	—
	12.00	.....	393	21	11	8	1		0	—
	.....	4.00	394	65	5	6	1		0	0
14....	10.00	.....	395	60	10	15	2		0	0
	12.00	.....	396	60	7	10	3		0	+
	.....	4.00	397	68	1	20	3		0	0
15....	10.00	.....	398	230	13	10	2		0	+
	12.00	.....	399	96	7	3	2		0	0
	.....	4.00	400	17	4	6	1		—	—

End of infected period due to placing strips in the filters.

NOTE.—Filter Effluent count higher than Influent.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
up for at least 18 inches.													
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	+
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	—	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
—	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	0	.....	.....	.....	.....
—	.....	.....	+	.....	+	.....	.....	.....	0	.....	.....	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	.....	.....	0
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0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	+	.....	*	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	*	.....	*	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0

APPENDIX A—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
July 16....	10.00	.....	401	140	3	35	3	.....	+	+
	12.00	.....	402	280	2	51	1	.....	+	+
18....	10.00	.....	403	275	5	105	3	.....	+	+
	12.00	.....	404	116	11	17	5	.....	0	0
	.....	4.00	405	36	5	1	1	.....	0	+
19....	10.00	.....	406	67	6	6	2	.....	0	+
	12.00	.....	407	—	—	13	2	.....	0	0
	.....	4.00	408	100	13	12	7	.....	0	0
20....	10.00	.....	409	170	6	3	2	.....	+	—
	12.00	.....	410	126	5	80	6	.....	+	+
	.....	4.00	411	84	5	19	5	.....	0	+
21....	10.00	.....	412	115	8	45	2	.....	—	+
	12.00	.....	413	120	6	21	3	.....	—	0
	.....	4.00	414	120	7	64	2	.....	0	0
22....	10.00	.....	415	100	4	9	2	.....	0	0
	12.00	.....	416	125	14	11	2	.....	0	0
	.....	4.00	417	70	18	10	2	.....	+	+
23....	10.00	.....	418	70	2	3	1	.....	0	0
	12.00	.....	419	70	6	2	4	.....	+	+
	.....	4.00	420	—	—	—	—	93.0		
				115.0	8.0	22.5	2.5	88.9		
July 26....	.....	4.00	420	62	33	10	8	.....	0	+
27....	10.00	.....	421	95	5	12	4	.....	.....	.....
	12.00	.....	422	18	4	4	1	.....	.....	.....
	.....	4.00	423	145	5	—	12	.....	0	0
28....	10.00	.....	424	10	5	6	0	.....	0	+
	12.00	.....	425	145	5	11	5	.....	.....	.....
	.....	4.00	426	175	2	91	4	.....	+	+
29....	10.00	.....	427	65	3	7	2	.....	0	0
	12.00	.....	428	39	29	4	2	.....	0	0
30....	10.00	.....	429	350	13	3	2	.....	0	0
Aug. 2....	10.00	.....	430	10	2	7	4	.....	.....	.....
	12.00	.....	431	6	1	9	3	.....	.....	.....
3....	10.00	.....	432	10	4	3	2	.....	.....	0
	12.00	.....	433	10	3	3	2	.....	.....	0
5....	10.00	.....	434	181	4	2	0	.....	0	0
	12.00	.....	435	91	5	27	0	.....	.....	0
6....	10.00	.....	436	24	0	1	—	.....	.....	.....
	12.00	.....	437	40	1	—	1	.....	.....	.....
8....	10.00	.....	438	80	3	0	0	.....	.....	.....
	12.00	.....	439	102	1	—	12	.....	.....	.....
9....	10.00	.....	440	43	6	1	—	.....	.....	.....
	12.00	.....	441	99	0	1	0	.....	.....	.....
10....	10.00	.....	442	13	1	1	1	.....	0	0
	12.00	.....	443	23	0	0	1	.....	0	0
11....	10.00	.....	444	58	0	47	0	.....	0	0
	12.00	.....	445	58	0	17	0	.....	0	—
12....	10.00	.....	446	49	2	65	0	.....	—	0
	12.00	.....	447	52	0	20	1	.....	0	0
13....	12.00	.....	448	121	—	4	1	.....	0	0
15....	10.00	.....	449	13	2	2	0	.....	0	0
	12.00	.....	450	115	0	1	—	.....	0	+
16....	10.00	.....	451	63	0	4	0	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+			+		+								0
+			—		+								0
+			+		+								0
0			0		+								—
+			—		—								0
0			+		+								0
0			+		+								0
0			—		—								0
—			+		+								0
+			+		—								—
+			+		+								—
+			+		+								—
0			+		+								0
+			+		+								+
0			0		+								0
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0		0	0					0			0		
0		0	+					0			0		
0		0	0					0			0		
0		0	0					0			0		0
0				0	0						0		0
0				+	0						0		0
0				—	+						—		+
+				—	+						—		—
0				—	+						—		—
0				0	+						0		—
0				0	+						0		0
0				+	+	0	0	0			0		0
+				+		0	0	0			0		0
+				0		0	0	0			0		0

APPENDIX A—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910	12.00	.....	452	17	1	0	0	.....	0	0
Aug. 17....	12.00	.....	453	51	10	1	1	.....	0	0
18....	10.00	.....	454	127	7	10	1	.....	0	—
	12.00	.....	455	93	1	2	3	.....	0	—
19....	10.00	.....	456	436	8	5	—	.....	0	+
	12.00	.....	457	345	5	6	0	.....	0	0
20....	10.00	.....	458	121	16	2	3	.....	0	+
22....	10.00	.....	459	186	—	10	10	.....	0	0
	.....	4.00	460	142	13	12	—	.....	0	—
23....	.....	4.00	461	.....	—	.....	0	94.5	.....	.....
				94.7	5.1	10.8	2.3	78.7		
30....	10.00	.....	462	233	156	12	105	.....	0	—
	12.00	.....	463	900	126	90	105	.....	—	—
31....	10.00	.....	464	140	73	8	74	.....	0	0
	12.00	.....	465	130	80	31	70	.....	+	+
	.....	4.00	466	60	85	4	120	.....	0	—
Sept. 1....	10.00	.....	467	280	45	34	34	.....	—	+
	12.00	.....	468	140	41	21	28	.....	—	+
2....	10.00	.....	469	1440	60	?	17	.....	0	+
	12.00	.....	470	185	50	24	21	.....	+	+
	.....	4.00	471	164	60	36	33	.....	+	+
3....	10.00	.....	472	24	25	4	56	.....	0	+
	12.00	.....	473	18	12	6	4	.....	+	+
6....	10.00	.....	474	290	62	63	8	.....	.....	+
	12.00	.....	475	18	6	2	2	.....	.....	0
	.....	4.00	476	36	8	3	5	.....	—	+
7....	10.00	.....	477	130	2	11	2	.....	+	+
	12.00	.....	478	343	5	57	7	.....	.....	.....
	.....	4.00	479	150	6	3	5	.....	.....	.....
8....	10.00	.....	480	108	5	24	12	.....	+	+
	12.00	.....	481	62	4	11	2	.....	0	+
	.....	4.00	482	—	7	4	9	.....	.....	+
9....	10.00	.....	483	310	14	47	6	.....	—	+
	12.00	.....	484	224	6	32	4	.....	+	+
	.....	4.00	485	116	5	45	9	.....	+	+
10....	10.00	.....	486	265	4	17	25	.....	+	+
	12.00	.....	487	77	3	25	4	.....	+	+
12....	10.00	.....	488	520	3	10	4	.....	+	+
	12.00	.....	stop'd	244.7	35.1	23.3	28.5			
	.....	.....	489	.....	.....	.....	.....	.....	.....	.....
	.....	.....	490	.....	.....	.....	.....	.....	.....	.....
13....	10.00	.....	491	580	8	7	14	.....	.....	.....
14....	10.00	.....	492	2,000	50	80	44	.....	+	+
	12.00	4.00	493	1,200	60	54	85	.....	+	+
	.....	4.00	494	900	2	25	11	.....	+	+
15....	10.00	.....	495	12	3	1	9	.....	+	+
	12.00	.....	496	16	4	3	2	.....	+	+
	.....	4.00	497	28	7	12	3	.....	+	+
16....	10.00	.....	498	32	12	7	9	.....	0	+
	12.00	.....	499	9	1	—	—	.....	0	+
	.....	4.00	500	16	3	4	6	.....	—	+
17....	10.00	.....	501	12	6	—	2	.....	—	+

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	.....	.....	0	.....	0	0	0	.....	.....	0	.....	.....
0	.....	.....	.....	0	—	0	0	0	.....	.....	0	.....	.....
0	.....	.....	.....	0	+	0	0	0	.....	.....	0	.....	.....
0	.....	.....	.....	0	+	0	0	0	.....	.....	0	.....	0
+	.....	.....	.....	+	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	.....	+	.....	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	.....	+	—	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	.....	+	+	.....	.....	0	.....	.....	0	.....	—
0	.....	.....	.....	+	+	.....	.....	—	.....	.....	—	.....	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	—	.....	+
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
0	.....	.....	+	.....	—	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	—	.....	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	—	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	+	.....	.....	+	.....	+
—	.....	.....	+	.....	+	.....	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	+	.....	.....	+	.....	+
.....	.....	.....	—	.....	+	.....	+	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	—	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	—	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	—	.....	.....
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+	.....	.....	+	.....	+	+	0	—	.....	.....	+	.....	+
+	.....	.....	+	.....	+	—	—	+	.....	.....	—	.....	+
+	.....	.....	+	.....	+	—	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	—	—	+	.....	.....	+	.....	+
+	.....	.....	+	.....	.....	.....	+	+	.....	.....	+	.....	.....
+	.....	+	.....	.....	.....	+	+	.....	+	.....	+	.....	.....
.....	.....	.....	+	.....	+	.....	0	.....	.....	.....	+	.....	.....
.....	.....	.....	.....	.....	+	.....	—	.....	.....	.....	+	.....	+
.....	+	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....
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.....	+	.....	+	.....	+	.....	+	+	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	+	+	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	0	+	.....	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	+	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	+	0	.....	.....	+	.....	.....
+	.....	.....	+	.....	+	.....	—	—	.....	.....	—	.....	.....
+	.....	.....	+	.....	+	.....	0	+	.....	.....	+	.....	.....
+	.....	.....	+	.....	+	.....	0	—	.....	.....	+	.....	.....
—	.....	.....	+	.....	.....	.....	0	—	.....	.....	0	.....	.....

APPENDIX A—
SAND

EXPERIMENTAL STATION. TANK "A"—RATE 5,000,000 GALLONS

Date. 1910	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Sept. 19....	10.00	.....	502	73	10	15	2	.....	—	+
	12.00	.....	503	23	4	11	2	.....	+	—
	.....	4.00	504	103	1	4	0	.....	+	+
20....	10.00	.....	505	35	12	3	—	.....	*0	0
22....	.....	5.00	506	142	3	9	2	.....	0	+
23....	10.00	.....	507	96	6	1	4	.....	+	+
	12.00	.....	508	320	4	2	2	.....	0	0
24....	12.00	.....	509	43	2	—	1	.....	—	+
26....	12.00	.....	510	—	—	—	—	.....	0	—
27....	.....	4.00	511	—	—	3	1	.....	0	—
28....	12.00	.....	512	536	11	44	3	.....	—	+
29....	.....	5.00	513	590	17	—	2	.....	—	—
30....	9.00	.....	stop'd	323.6	10.7	15.8	10.1			
30....	.....	5.00	514	710	70	69	24	.....	0	0
Oct. 1....	12.00	.....	514	51	3	45	3	.....	0	0
3....	.....	5.00	516	247	5	5	3	.....	0	0
4....	.....	4.00	517	30	7	55	7	.....	.....	0
5....	12.00	.....	518	21	8	35	0	.....	.....	0
6....	12.00	.....	519	34	5	6	0	.....	.....	+
7....	12.00	.....	520	141	14	13	2	.....	.....	+
8....	12.00	.....	521	145	4	1	0	.....	.....	0
10....	12.00	.....	522	153	8	2	3	.....	.....	0
11....	.....	4.00	523	200	2	2	2	.....	.....	.....
12....	12.00	.....	524	71	—	0	1	.....	0	0
13....	12.00	.....	525	28	5	3	1	.....	0	0
14....	12.00	.....	526	156	4	2	2	.....	0	0
15....	12.00	.....	527	71	3	6	—	.....	0	0
17....	.....	5.00	528	388	7	3	4	.....	0	+
18....	.....	5.00	529	180	3	9	0	.....	0	+
19....	.....	5.00	530	800	3	900	1	.....	0	0
20....	10.00	.....	531	640	60	50	47	.....	0	+
21....	.....	4.00	532	1,200	5	359	5	.....	—	—
22....	10.00	.....	stop'd	277.1	12	82.3	5.8			

RATE 10,000,000 GALLONS

Oct. 24....	10.00	.....	534	42	11	1	5	.....	0	0
	.....	4.00	535	240	14	6	0	.....	0	+
25....	10.00	.....	536	130	46	3	1	.....	0	—
26....	10.00	.....	537	196	1	5	1	.....	0	—
27....	12.00	.....	538	—	0	8	3	.....	0	0
28....	.....	5.00	539	37	67	9	93	.....	0	0
29....	12.00	.....	540	59	274	7	2	.....	0	0
Nov. 1....	10.00	.....	541	75	64	4	0	.....	0	0
4....	.....	3.00	542	150	200	7	—	.....	0	0
5....	10.30	.....	543	52	17	6	—	.....	0	0
7....	9.33	.....	stop'd	109	69.4	5.6	13.1			
9....	10.00	.....	544	1	2,500	3	14	.....	0	0
10....	10.00	.....	545	186	700	9	7	.....	0	0
11....	.....	5.00	stop'd	93.5	1,600	6	10.5			

The 37°C. Incubator Temperature jumped to 57°C.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	.....	+	.....	.....	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	+
.....	+	.....	+	.....	+	.....	.....	.....	—	.....	0	.....	—
.....	—	.....	+	.....	—	.....	0	.....	0	.....	0	.....	—
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	—	.....	—
0	.....	.....	+	.....	+	.....	0	.....	0	.....	—	.....	—
.....	—	.....	—	.....	+	.....	.....	.....	—	.....	—	.....	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	—	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	+	.....	.....	.....	0	.....	0	.....	+
.....	0	.....	+	.....	+	.....	.....	.....	—	.....	+	.....	+
.....	0	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	+
.....	.....	.....	.....	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	+
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0

PER ACRE PER DAY.

.....	0	.....	—	.....	—	0	—	.....	—	.....	—	.....	—
.....	+	.....	+	.....	+	0	0	.....	—	.....	0	.....	—
.....	—	.....	+	.....	+	0	0	.....	0	.....	0	.....	—
.....	0	.....	—	.....	0	0	0	.....	0	.....	+	.....	0
.....	—	.....	0	.....	+	0	0	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	—	.....	—
.....	—	.....	—	.....	+	0	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
.....	0	.....	—	.....	+	0	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	0	0	.....	—	.....	0	.....	—
.....	0	.....	0	.....	—	0	+	.....	0	.....	+	.....	0
.....	0	.....	0	.....	+	0	0	.....	0	.....	—	.....	—

APPENDIX A—

SAND

Tank "A"—RATE 3,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Nov. 12....	12.00	.....	547	12	3,000	3	5	.....	0	0
14....	10.00	.....	548	2	500	5	3	.....	0	0
15....	11.00	.....	549	0	250	2	3	.....	0	0
16....	12.00	.....	550	0	224	1	3	.....	0	0
17....	.....	5.00	551	0	100	0	0	.....	0	0
18....	11.30	.....	552	3	1,000	1	0	.....	0	0
19....	10.30	.....	553	0	374	1	0	.....	0	0
21....	.....	5.00	554	5	302	1	0	.....	0	0
22....	10.00	.....	555	8	265	8	2	.....	0	0
23....	.....	4.00	556	6	147	29	26	.....	0	0
24....	.....	5.00	557	1	90	1	1	.....	0	0
25....	10.30	.....	558	9	200	0	1	.....	0	0
26....	.....	1.00	559	5	190	4	5	.....	0	0
28....	10.00	.....	560	—	—	1	2	.....	0	0
29....	10.00	.....	561	—	—	11	9	.....	0	0
Dec. 1....	.....	5.00	562	2	15	2	5	.....	0	0
2....	.....	4.00	563	14	960	9	3	.....	0	0
3....	12.30	.....	564	16	58	10	6	.....	0	0
5....	.....	4.00	565	22	56	6	0	.....	0	0
6....	10.00	.....	566	7	80	2	1	.....	0	0
7....	.....	4.00	567	56	15	4	1	.....	0	0
8....	.....	3.30	568	11	20	3	1	.....	0	0
9....	.....	4.30	569	15	207	4	3	.....	.....	.....
10....	11.50	.....	570	100	12	—	—	.....	.....	.....
14....	.....	3.00	571	32	71	2	1	.....	0	0
15....	.....	5.30	572	22	55	5	3	.....	0	0
16....	.....	5.00	573	13	27	1	0	.....	0	0
19....	.....	3.00	574	45	39	2	1	.....	0	+
22....	.....	4.00	575	53	11	0	0	.....	0	0
27....	.....	4.00	576	50	65	—	—	.....	0	0
30....	.....	4.00	577	458	46	6	2	.....	0	0
Jan. 3....	.....	5.00	578	0	9	2	2	.....	+	0
				32.6	273.6	4.2	2.96			

NOTE.—Filter infection 18°C-22°C Effluent has higher count than Influent.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c.	1 c.c.	5 c.c.	10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	—	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	+	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	—	.....	0	.....	0
.....	—	.....	—	.....	+	.....	.....	.....	—	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	—
.....	0	.....	0	.....	0	.....	0	0	.....	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	.....	—	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	0	.....	+	.....	0	.....	.....	0	.....	.....	+	.....	+
.....	0	.....	+	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	+	.....	.....	+	.....	+
.....	0	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	+

APPENDIX A—

SAND

TANK "B"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read. 6	Max. Loss of Head.	Bacterial Counts. 18°–22°C. Inf.	Bacterial Counts. 18°–22°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Sept. 15....	10.20	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	10.30	.....	1	.....	.....	90	90	.....	.....	.....
	12.00	.....	2	.....	.....	120	40	.....	.....	.....
	.....	4.00	3	.....	.....	310	20	.....	.....	.....
16....	9.30	.....	4	1.95	1.95	230	50	.....	.....	.....
	12.00	.....	5	.....	.....	170	60	.....	.....	.....
	.....	4.00	6	.....	.....	70	42	.....	.....	.....
17....	9.30	.....	7	3.0	3.0	520	32	.....	.....	.....
	12.00	.....	8	.....	.....	180	30	.....	.....	.....
	.....	3.45	9	.....	.....	70	26	.....	.....	.....
	.....	4.15	stop	3.3	3.3	173.3	43.3	75.0	.....	.....
18....	11.40	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	11	1.9	1.9	—	—	.....	.....	.....
20....	12.00	.....	12	3.15	3.15	260	12	.....	.....	.....
	.....	4.00	13	3.3	3.3	150	18	.....	.....	.....
	.....	4.00	stop	.....	.....	205	15	94.6	.....	.....
21....	11.45	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	15	.....	.....	80	26	.....	.....	.....
	.....	4.00	16	1.8	1.8	148	14	.....	.....	.....
22....	9.30	.....	17	2.15	2.15	560	11	.....	.....	.....
	12.00	.....	18	.....	.....	250	16	.....	.....	.....
	.....	4.00	19	.....	.....	680	8	.....	.....	.....
23....	9.30	.....	20	3.3	3.3	350	5	.....	.....	.....
	9.30	.....	stop	0	.....	344.6	13.3	96.2	.....	.....
	.....	12.45	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.15	22	.....	.....	400	3	.....	.....	.....
24....	9.45	.....	23	1.45	1.45	540	6	.....	.....	.....
	12.00	.....	24	.....	.....	250	11	.....	.....	.....
	.....	4.00	25	.....	.....	430	—	.....	.....	.....
25....	9.30	.....	26	2.05	2.05	390	2	.....	.....	.....
	12.00	.....	27	.....	.....	24,000	5	.....	.....	.....
	.....	4.00	28	.....	.....	290	10	.....	.....	.....
27....	8.30	.....	stop	3.3	3.3	3,240	5.2	99.8	.....	.....
	.....	12.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	31	1.8	1.8	390	8	.....	.....	.....
28....	9.30	.....	32	1.8	1.8	1,180	6	.....	.....	.....
	12.00	.....	33	.....	.....	920	8	.....	.....	.....
	.....	4.00	34	3.1	3.1	730	11	.....	.....	.....
29....	9.30	.....	35	.....	.....	1,200	6	.....	.....	.....
	.....	4.00	36	.....	.....	110	0	.....	.....	.....
	.....	4.30	stop	3.3	3.3	788.3	6.5	99.1	.....	.....
30....	2.50	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	2.50	39	.....	.....	—	21	.....	.....	.....
	.....	3.00	40	.....	.....	—	15	.....	.....	.....
	.....	3.30	41	.....	.....	—	13	.....	.....	.....
	.....	3.45	42	.....	.....	—	15	.....	.....	.....
	.....	4.00	43	.....	.....	214	11	.....	.....	.....
Oct. 1....	9.30	.....	44	.....	.....	280	8	.....	.....	.....
	12.00	.....	48	.....	.....	120	4	.....	.....	.....
	.....	4.00	49	3.0	3.0	76	12	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C

APPENDIX A—

SAND

TANK "B"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1909	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read. 6	Max. Loss of Head.	Bacterial Counts 18°-22°C. Inf.	Bacterial Counts 18°-22°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Oct. 2....	9.30	.....	50	.....	.....	380	1	.....	.....	.....
	12.00	.....	51	2.6	2.6	257	1	.....	.....	.....
4....	9.30	.....	stop	3.3	3.3	219.5	6.1	97.4		
	.....	3.00	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	53	2.4	2.4	157	10	.....	.....	.....
5....	9.30	.....	54	2.1	2.1	200	20	.....	.....	.....
	12.00	.....	55	2.05	2.05	112	8	.....	.....	.....
	.....	4.00	56	2.4	2.4	173	0	.....	.....	.....
6....	9.30	.....	57	1.85	1.85	440	6	.....	.....	.....
	12.00	.....	58	2.05	2.05	230	2	.....	—	—
	.....	4.00	59	1.85	1.85	260	2	.....	+	+
7....	9.30	.....	60	2.3	2.3	270	1	.....	+	+
	12.00	.....	61	2.4	2.4	220	1	.....	+	+
	.....	4.00	62	2.5	2.5	220	4	.....	—	+
8....	9.30	.....	63	3.0	3.0	940	12	.....	.....	.....
	12.00	.....	64	3.2	3.2	290	8	.....	.....	.....
	.....	12.45	stop	3.3	3.3	292.6	6.1	97.9		
	.....	5.00	start	0.0	0.0	.....	.....	.....	.....	.....
9....	9.30	.....	66	2.1	2.1	200	5	.....	.....	.....
	12.00	.....	67	2.1	2.1	400	2	.....	—	+
11....	9.30	.....	68	1.9	1.9	560	1	.....	-	—
	12.00	.....	69	2.0	2.0	150	2	.....	-	+
	.....	4.00	70	1.9	1.9	89	0	.....	—	+
12....	9.00	.....	71	2.25	2.25	144	3	.....	—	+
	12.00	.....	72	2.3	2.3	151	2	.....	—	+
	.....	4.00	73	2.4	2.4	157	0	.....	+	+
13....	9.30	.....	74	3.0	3.0	151	1	.....	—	+
	12.00	.....	75	3.1	3.1	134	0	.....	+	+
	.....	4.00	76	3.25	3.25	51	0	.....	+	+
14....	9.30	.....	77	4.25	4.25	200	4	.....	—	+
	9.30	.....	stop	.....	.....	198.9	1.6	99.4		
15....	.....	12.15	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	82	2.2	2.2	240	2	.....	.....	.....
16....	9.30	.....	83	1.9	1.9	70	5	.....	.....	.....
	12.00	.....	84	1.7	1.7	202	3	.....	.....	.....
18....	12.00	.....	85	2.2	2.2	220	2	.....	.....	.....
	.....	3.30	86	2.4	2.4	129	6	.....	.....	.....
19....	9.30	.....	87	3.15	3.15	160	3	.....	.....	.....
	10.45	.....	stop	3.3	3.3	170.1	3.5	97.9		
20....	9.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	9.30	.....	90	.....	.....	170	4	.....	.....	.....
	12.00	.....	91	1.8	1.8	1,200	4	.....	.....	.....
	.....	4.00	92	2.0	2.0	3,460	161	.....	.....	.....
21....	9.30	.....	93	2.8	2.8	2,580	11	.....	.....	.....
	12.00	.....	94	3.3	3.3	920	89	.....	.....	.....
	.....	1.00	stop	3.3	3.3	1,666	53.6	96.9		
	.....	4.30	start	0.0	0.0	.....	.....	.....	.....	.....
22....	9.00	.....	stop	3.3	3.3	.....	.....	.....	.....	.....
26....	.....	3.30	start	0.0	0.0	.....	.....	.....	.....	.....
26....	.....	4.00	96	2.9	2.9	160	7	.....	—	+
27....	9.30	.....	97	2.15	2.15	91	8	.....	—	+
	12.00	.....	98	2.1	2.1	60	3	.....	—	+
	.....	4.00	99	2.1	2.1	40	4	.....	+	—

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
—	—	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	—
+	+	+	+	+	+	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
						—	—	—	+	+	+	+	+
+	+	+	+	+	+	+	—	+	—	+	+	+	+
+	+	+	+	+	+	—	—	—	—	—	—	+	+
+	+	+	+	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	+	—	—	—	+	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	+	+	—	—	+	+
+	+	+	+	+	+	—	+	—	—	+	+	+	+
+	+	+	+	+	+	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	—	+	—	+	+	+	+
+	—	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
+	+	+	+	+	+	+	—	—	+	+	+	—	+
+	+	+	+	+	+	—	—	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+	+

APPENDIX A—

SAND

TANK "B"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1909	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 6	Max. loss of head.	Bacterial Counts. 18°-22°C Inf.	Bacterial Counts. 18°-22°C Eff	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Oct. 28....	12.00	.....	100	1.6	1.6	35	0	.....	—	+
	.....	3.00	101	1.7	1.7	60	2	.....	.....	.....
29....	.....	3.00	102	2.1	2.1	60	3	.....	—	+
30....	9.30	.....	103	2.8	2.8	55	3	.....	-	+
	12.00	.....	104	3.1	3.1	80	3	.....	.....	.....
	12.00	.....	stop	.....	.....	71.2	36.6	48.6		
Nov. 1....	11.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	106	2.5	2.5	60	26	.....	.....	.....
	.....	3.00	107	2.6	2.6	30	1	.....	.....	.....
3....	.....	4.00	108	2.0	2.0	41	6	.....	.....	.....
5....	9.30	.....	109	2.5	2.5	70	4	.....	.....	.....
	12.00	.....	110	2.6	2.6	60	4	.....	.....	.....
	.....	3.00	111	2.65	2.65	35	12	.....	.....	.....
6....	9.30	.....	112	3.3	3.3	40	4	.....	.....	.....
	10.00	.....	stop	3.3	3.3	56	9.5	83.1		
	.....	1.00	start	0.0	0.0	.....	.....	.....	.....	.....
8....	12.00	.....	114	1.6	1.6	55	7	.....	.....	.....
	.....	4.00	115	1.7	1.7	85	4	.....	.....	.....
9....	10.00	.....	116	2.1	2.1	100	10	.....	.....	.....
	12.00	.....	117	2.2	2.2	75	15	.....	.....	.....
	.....	4.00	118	2.6	2.6	65	6	.....	.....	.....
10....	9.30	.....	stop	3.3	3.3	76	8.4	89.0		
11....	12.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	3.30	124	2.4	2.4	35	1	.....	—	—
12....	9.30	.....	125	2.3	2.3	40	—	.....	+	—
	.....	3.00	126	2.3	2.3	125	6	.....	—	—
13....	9.30	.....	127	2.8	2.8	85	5	.....	—	—
	12.00	.....	128	2.9	2.9	90	17	.....	—	—
	.....	1.00	stop	3.3	3.3	75	5.8	92.3		
16....	.....	2.00	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	3.30	133	2.3	2.3	100	10	.....	—	—
17....	12.00	.....	134	1.2	1.2	430	—	.....	—	—
	.....	4.00	135	2.3	2.3	800	—	.....	+	+
18....	9.30	.....	136	3.25	3.25	250	—	.....	—	+
	10.00	.....	stop	3.3	3.3	395	10	97.5		
19....	9.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	9.30	.....	139	.....	.....	280	32	.....	.....	.....
	12.00	.....	140	2.1	2.1	135	20	.....	.....	.....
22....	.....	3.30	141	2.1	2.1	6,400	114	.....	+	+
23....	9.00	.....	stop	.....	.....	2,281	55.3	97.6		
27....	10.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
29....	9.30	.....	147	.....	.....	620	49	.....	+	+
29....	12.00	.....	148	.....	.....	470	41	.....	—	+
	.....	4.00	149	.....	.....	300	29	.....	—	+
	.....	4.00	stop	.....	.....	463	39.6	91.4		
30....	.....	1.30	start	.....	.....	.....	.....	.....	.....	.....
Dec. 1....	9.30	.....	151	.....	.....	90	23	.....	.....	.....
	12.00	.....	152	.....	.....	140	14	.....	.....	.....
	.....	4.00	153	.....	.....	110	20	.....	.....	.....
2....	9.30	.....	154	.....	.....	160	18	.....	.....	.....
3....	9.30	.....	stop	.....	.....	125	18.7	85.0	.....	.....

New sand placed in February. 20 cubic yards received on Jan. 28, 1910.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	+	+	+	+	+	—	—	+	—	—			
+	+	+	+	+	+	—	—	+	—		+		
—	+	+	+	+	+	—	+	+	+	—			
+	+	—	+	+	+	—	+	+	—	—	+	+	+
+	+	+	+	+	+	—	—	+	—	—	—	+	+
—	+	+	+	+	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	+	—	—	+
+	+	+	+	—	—	—	—	—	+	+	—	—	+
—	+	+	—	+	+	—	—	+	—	—	—	—	—
+	+	+	+	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	—	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	—	+	+	+	+	—	—
+	+	+	+	+	+	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+

APPENDIX A—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Feb. 16....	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
17....	10.00	.....	163	215	15	.....	.....	.....	+	+
	12.00	.....	164	290	35	.....	.....	.....	0	+
	.....	4.00	165	670	106	.....	.....	.....	+	+
18....	9.30	.....	stop	392	52	.....	.....	86.7	.....	.....
	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
19....	10.00	.....	169	43	32	.....	.....	.....	+	+
	12.00	.....	170	112	40	.....	.....	.....	+	+
21....	9.30	.....	171	40	4	.....	.....	.....	0	0
	10.00	.....	stop	65	25	.....	.....	61.5	.....	.....
	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
22....	10.00	.....	174	35	2	.....	.....	.....	0	0
	12.00	.....	175	475	12	.....	.....	.....	+	+
	.....	3.30	176	4110	170	23 10	1 1	.....	+	+
23....	10.00	.....	177	290	12	.....	.....	.....	+	+
	12.00	.....	178	155	24	.....	.....	.....	+	+
	.....	4.00	179	110	31	1 0	2 0	.....	0	+
24....	10.00	.....	180	55	12	.....	.....	.....	+	+
	12.00	.....	181	72	52	.....	.....	.....	0	0
	.....	4.00	182	14	56	1 0	0 0	.....	+	+
25....	10.00	.....	183	42	52	.....	.....	.....	0	0
	10.30	.....	stop	535.8	42.3	8.3 3.3	1 1	92.1		
	.....	4.30	start	.....	.....	88% 90%	.....	.....	.....	.....
26....	9.30	.....	186	75	40	0 0	0 0	.....	0	0
	11.00	.....	187	120	40	.....	.....	.....	0	0
28....	10.00	.....	188	30	20	.....	.....	.....	0	+
	12.00	.....	189	30	18	.....	.....	.....	0	0
	.....	4.00	190	320	23	3 3	0 0	.....	—	—

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	+	+	+	+	+	0	+	—	+	+	+	+	+
+	+	+	+	+	+	0	+	+	+	+	+	+	+
+	+	+	+	+	+	0	+	+	+	+	+	+	+
+	+	+				0	+	+	+	+			
+	+	+				+	+	0	+	+			
0	+	—				0	0	+	+	+			
0	0	0				0	0	+	+	+			
+	+	+				0	—	+	0	+			
+	+	+				0	+	+	+	+			
+	+	+				0	+	+	+	+			
+	+	+				+	+	+	+	+			
+	+	+				—	+	+	+	+			
+	+	+				0	+	—	+	+			
0	—	—				0	+	—	+	+			
—	+	+				0	+	+	+	+			
+	+	+				0	+	+	0	+			
0	+	+				0	0	0	+	+			
0	0	+				0	+	0	—	0			
0	0	0				0	+	+	+	+			
0	0	0				0	+	+	+	+			
+	+	+				0	0	0	+	+			

APPENDIX A—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date 1910	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read. 1	2	3	4	5	6	Max. Loss of Head.	Bacterial Counts. 18°-22°C. Inf.	Eff.	37.5°C. Inf.	Eff.	Bact. Eff'cy.
March 1....	10.00	.....	191	...	...	...	...	...	...	...	2,710	806	.....	.....	.....
	12.00	.....	192	...	...	...	...	...	...	...	1,250	518	.....	.....	.....
	.....	4.00	193	...	...	...	...	...	...	...	380	320	4 0	30 4	.....
2....	10.00	.....	194	...	...	...	...	...	...	...	1,350	430	.....	.....	.....
	12.00	.....	195	...	...	...	...	...	...	...	720	305	.....	.....	.....
	.....	4.00	196	...	...	...	...	...	...	...	340	150	0 0	0 0	.....
3....	10.00	.....	197	...	...	...	...	...	...	...	560	25	.....	.....	.....
	12.00	.....	198	...	...	...	...	...	...	...	390	39	.....	.....	.....
	.....	4.00	199	...	...	...	...	...	...	...	210	103	0 0	0 0	.....
4....	10.00	.....	200	...	...	...	...	...	...	...	4,100	610	.....	.....	.....
	12.00	.....	201	...	...	...	...	...	...	...	4,900	620	.....	.....	.....
	.....	4.00	202	...	...	...	...	...	...	...	5,200	760	14 0	4 2	.....
5....	10.00	.....	203	...	...	...	...	...	...	...	790	560	.....	.....	.....
	12.00	.....	stop	...	...	...	...	...	...	...	1,304	299	3.5 .5	5.6 1.	77.%
7....	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
8....	10.00	.....	206	2.4	2.4	1.9	1.0	.5	.2	2.2	6,880	145	.....	.....	.....
	12.00	.....	207	2.3	2.3	1.9	1.0	.5	.2	2.1	120	100	.....	.....	.....
	.....	4.00	208	2.3	2.3	1.8	.9	.6	.2	2.1	1.010	399	28 0	4 0	.....
9....	10.00	.....	209	2.0	2.0	1.6	.9	.7	.2	1.8	3,980	598	.....	.....	.....
	12.00	.....	210	2.0	2.0	1.6	.9	.7	.2	1.8	2.120	595	.....	.....	.....
	.....	4.00	211	1.9	1.9	1.5	1.0	.7	.2	1.7	2,130	700	21 1	9 2	.....
10....	10.00	.....	212	1.8	1.8	1.6	1.1	.8	.2	1.6	2,010	495	.....	.....	.....
	12.00	.....	213	1.8	1.8	1.6	1.1	.8	.2	1.6	3,500	485	.....	.....	.....
	.....	4.00	214	1.8	1.8	1.6	1.2	.9	.2	1.6	1,190	366	25 0	4 0	.....
11....	10.00	.....	215	1.8	1.8	1.6	1.2	1.0	.2	1.6	780	257	.....	.....	.....
	12.00	.....	216	1.8	1.8	1.6	1.2	.9	.2	1.6	390	201	.....	.....	.....
	.....	4.00	217	1.8	1.8	1.6	1.2	.9	.2	1.6	1,070	224	4 0	4 0	.....
12....	10.00	.....	218	1.9	1.9	1.7	1.3	1.1	.2	1.7	300	143	.....	.....	.....
	12.00	.....	219	1.9	1.9	1.7	1.3	1.0	.2	1.7	390	87	.....	.....	.....
14....	10.00	.....	220	2.3	2.3	2.2	1.8	1.6	.2	2.1	500	88	.....	.....	.....
	12.00	.....	221	1.4	2.4	2.1	1.8	1.6	.2	2.2	150	28	.....	.....	.....
	.....	4.00	222	2.4	2.4	2.2	1.8	1.6	.2	2.2	156	15	24 2	4 1	.....
15....	10.00	.....	223	2.6	2.6	2.4	2.0	1.8	.2	2.4	760	98	.....	.....	.....
	12.00	.....	224	2.8	2.8	2.4	2.1	1.8	.2	2.6	1,070	250	.....	.....	.....
	.....	4.00	225	2.7	2.7	2.5	2.1	1.9	.2	2.5	1,430	298	18 1	9 6	.....
16....	10.00	.....	226	2.9	2.9	2.7	2.3	2.1	.2	2.7	210	96	.....	.....	.....
	12.00	.....	227	2.9	2.9	2.7	2.3	2.1	.2	2.7	250	75	.....	.....	.....
	.....	4.00	228	2.9	2.9	2.8	2.4	2.2	.2	2.7	262	75	10 1	11 2	.....
17....	10.00	.....	229	3.0	3.0	2.8	2.5	2.2	.2	2.8	90	34	.....	.....	.....
	12.00	.....	230	3.1	3.1	2.9	2.6	2.4	.2	2.9	360	56	.....	.....	.....
	.....	4.00	231	3.2	3.2	3.0	2.6	2.4	.2	3.0	3,200	36	38 3	1 1	.....
18....	10.00	.....	232	3.5	3.5	3.3	3.0	2.8	.2	3.3	920	118	.....	.....	.....
	10.30	.....	stop	...	...	...	...	...	...	...	1,305	224	.....	.....	82.8
19....	9.00	.....	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	10.00	.....	235	1.9	1.9	1.6	1.0	.6	.2	1.7	850	104	.....	.....	.....
21....	10.00	.....	236	2.0	2.0	1.7	1.0	.8	.2	1.8	250	41	.....	.....	.....
	12.00	.....	237	2.0	2.0	1.6	1.0	.7	.2	1.8	960	29	.....	.....	.....
	.....	4.00	238	2.1	2.1	1.7	1.1	.8	.2	1.9	500	64	14 0	3 0	.....
22....	10.00	.....	239	2.1	2.1	1.9	1.4	1.1	.2	1.9	80	38	.....	.....	.....
	12.00	.....	240	2.1	2.1	1.9	1.5	1.1	.2	1.9	55	15	.....	.....	.....
	.....	4.00	241	2.2	2.2	2.0	1.6	1.2	.2	2.0	64	3	8 0	1 0	.....
23....	10.00	.....	242	2.5	2.5	2.3	1.9	1.6	.2	2.3	200	25	.....	.....	.....
	12.00	.....	243	2.5	2.5	2.3	1.9	1.7	.2	2.3	120	8	.....	.....	.....
	.....	4.00	244	2.5	2.5	2.3	1.9	1.6	.2	2.3	70	10	6 0	3 0	.....
29....	9.00	.....	stop	...	...	...	...	...	...	...	315.	33.7	.....	.....	89.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.							Effluent.						
1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.
0	+	+	+	+	.....	.....	0	—	+	+	+	.....	.....
+	0	0	+	+	.....	.....	+	+	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	0	0	+	+	.....	.....
0	+	+	—	+	.....	.....	0	+	—	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	0	—	+	.....	.....
0	0	0	0	+	.....	.....	0	0	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	+	0	0	0	.....	.....
0	0	0	+	+	.....	.....	+	0	0	0	+	.....	.....
0	+	0	+	+	.....	.....	0	0	0	0	+	.....	.....
+	+	+	+	+	.....	.....	+	+	+	—	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	+	+	—	0	.....	.....	0	+	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	+	0	+	+	+	.....	.....
+	0	+	+	+	.....	.....	0	0	+	+	+	.....	.....
+	+	—	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	0	+	+	.....	.....	+	+	+	+	+	.....	.....
0	0	+	+	+	.....	.....	0	0	0	0	+	.....	.....
0	0	0	+	+	.....	.....	0	0	—	+	+	.....	.....
0	0	+	+	+	.....	.....	0	+	—	+	+	.....	.....
0	0	0	0	0	.....	.....	0	0	+	+	+	.....	.....
0	0	0	0	0	.....	.....	0	+	0	0	+	.....	.....
+	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	0	0	+	+	+	.....	.....
—	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
0	+	—	+	+	.....	.....	0	—	+	+	+	.....	.....
0	0	+	+	+	.....	.....	0	0	+	+	+	.....	.....
0	+	+	+	+	.....	.....	0	0	+	+	—	.....	.....
0	+	+	+	+	.....	.....	0	0	0	+	0	.....	.....
0	+	+	0	+	.....	.....	0	+	0	+	+	.....	.....
+	+	+	+	+	.....	.....	0	0	+	+	+	.....	.....
+	+	+	+	+	.....	.....	0	0	—	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	+	+	+	.....	.....	0	+	0	0	+	.....	.....
—	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	0	.....	.....
0	0	—	0	+	.....	.....	0	0	0	+	0	.....	.....
0	0	0	0	0	.....	.....	+	0	0	0	0	.....	.....
0	0	0	—	+	.....	.....	0	0	0	+	0	.....	.....
0	0	0	0	—	.....	.....	0	0	0	—	0	.....	.....
0	0	0	0	—	.....	.....	0	+	0	+	0	.....	.....
0	0	+	—	+	.....	.....	0	0	0	+	—	.....	.....

APPENDIX A—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Apr. 4....	10.30	.....	start	.....	.....	.....	.....	.....	.....	.....
	12.00	.....	245	138	120	.....	.....	.....	0	0
	.....	4.00	246	142	47	.....	.....	.....	0	0
5....	10.00	.....	247	96	10	.....	.....	.....	0	0
	12.00	.....	248	188	17	.....	.....	.....	0	0
	.....	4.00	249	47	2	.....	.....	.....	0	0
6....	10.00	.....	250	30	10	.....	.....	.....	0	0
	12.00	.....	251	12	7	.....	.....	.....	0	0
	.....	4.00	252	15	6	.....	.....	.....	0	0
	.....	5.00	stop	82.5	27.4	.....	.....	66.8	.....	.....
May 6....	.....	4.00	262	117	57	12	8	.....	.....	.....
7....	10.00	.....	263	19	3	350	3	.....	.....	.....
	12.00	.....	264	25	5	18	3	.....	.....	.....
9....	10.00	.....	265	230	5	30	1	.....	.....	.....
	12.00	.....	266	87	9	22	2	.....	.....	.....
	.....	4.00	267	53	4	60	3	.....	.....	.....
10....	10.00	.....	268	86	4	15	7	.....	.....	.....
	12.00	1	269	80	8	8	10	.....	.....	.....
	.....	4.00	270	108	6	31	5	.....	.....	.....
11....	10.00	.....	271	17	3	14	4	.....	.....	.....
....	12.00	.....	272	149	5	144	6	.....	.....	.....
....	.....	4.00	273	38	7	480	6	.....	.....	.....
12....	10.00	.....	274	172	9	23	4	.....	.....	.....
	12.00	.....	275	158	5	16	320	.....	.....	.....
	.....	4.00	276	30	16	8	7	89.4	.....	.....
				91.2	9.7	28.0	4.9	82.5		
13....	.....	4.00	277	86	18	20	8	.....	.....	.....
14....	10.00	.....	278		3		3	.....	.....	.....
	12.00	.....	299	60	9	24	7	.....	.....	.....
16....	10.00	.....	280	106	4		2	.....	.....	.....
	12.00	.....	281	30	4	21	50	89.2	.....	.....
				70.5	7.6	21.7	14	35.5		
21....	12.00	.....	282	147	4	14	7	.....	.....	.....
25....	10.00	.....	283	12	5	7	5	94.4	.....	.....
				79.5	45	10.5	6	42.8		
27....	.....	4.00	284	80	8	20	3	.....	.....	.....
28....	10.00	.....	285	40	2	20	9	.....	.....	.....
	12.00	.....	286	48	4	20	4	.....	.....	.....
30....	10.00	.....	287	66	4	10	3	.....	.....	.....
30....	12.00	.....	288	45	5	19	3	.....	.....	.....
	.....	4.00	289	21	2	15	4	.....	.....	.....
31....	10.00	.....	290	65	8	10	3	.....	.....	.....
	12.00	.....	291	62	10	60	4	.....	.....	.....
	.....	4.00	292	55	6	9	5	.....	0	0
June 1....	10.00	.....	293	80	3	6	2	.....	.....	.....
	12.00	.....	294	58	3	4	6	.....	.....	.....
	.....	4.00	295	100	28	8	2	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0	0	0				0	0	0	0	+			
0	0	0				0	0	0	—	0			
0	0	0				0	0	0	0	0			
0	0	0				0	0	0	0	0			
0	0	0				0	0	0	0	0			
0	0	0				0	0	0	0	0			
+	+	0				0	0	0	+	0			
0	0	0				0	0	0	0	0			
					0								0
					0								0
					0								0
					0								0
					0								0
					0								0
					0								0
					0								0
					+								0
					0								0
					—								—
0		0			—								0
—		0			—								0

APPENDIX A—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910 June 2....	10.00	.....	296	45	3	4	5	88.8	.....	.....
				58.9	6.6	15.75	4.0	74.6		
3....	.....	4.00	297	26	5	5	2	.....	0	0
4....	10.00	.....	298	40	4	15	7	.....	.....	.....
	12.00	.....	299	1,440	5	40	6	.....	0	—
6....	10.00	.....	300	340	3	35	0	.....	.....	.....
	12.00	.....	301	30	2	9	0	.....	.....	.....
	.....	4.00	302	45	6	30	3	.....	0	0
7....	10.00	.....	303	100	4	8	3	.....	.....	.....
	12.00	.....	304	140	0	9	3	.....	.....	.....
	.....	4.00	305	28	3	2	5	.....	0	0
8....	10.00	.....	306	150	0	4	1	98.7	.....	.....
				233.9	3.2	15.7	2.8	82.2		
10 ...	10.00	.....	307	170	3	14	0	.....	0	0
11....	10.00	.....	308	45	5	1	3	.....	.....	.....
	12.00	.....	309	100	2	6	3	.....	0	—
13....	10.00	.....	310	500	5	85	4	.....	.....	.....
	12.00	.....	311	95	30	8	6	.....	.....	.....
	.....	4.00	312	110	9	15	1	.....	0	0
14....	10.00	.....	313	90	10	8	3	.....	0	0
	12.00	.....	314	36	4	15	4	.....	0	0
	.....	4.00	315	50	0	2	2	.....	0	0
15....	10.00	.....	316	35	4	5	5	.....	0	0
	12.00	.....	317	33	5	1	1	.....	0	0
16....	10.00	.....	318	50	3	2	0	.....	+	+
	12.00	.....	319	66	10	0	1	.....	0	0
	.....	4.00	320	58	14	6	2	.....	0	+
17....	10.00	.....	321	84	53	5	4	.....	0	0
	12.00	.....	322	80	—	5	—	.....	0	—
	.....	4.00	323	130	15	5	1	.....	0	0
18....	10.00	.....	324	53	3	1	1	.....	0	0
	12.00	.....	325	75	4	3	0	.....	0	0
20....	10.00	.....	326	30	11	0	1	.....	0	0
	12.00	.....	327	315	16	128	12	.....	0	0
	.....	4.00	328	32	18	2	1	.....	0	0
21....	10.00	.....	329	123	10	6	3	89.6	0	0
				102.7	10.6	14.0	2.6	81.4		
23....	10.00	.....	330	75	7	3	1	.....	0	0
	12.00	.....	331	45	12	12	0	.....	0	0
	.....	4.00	332	30	21	18	7	.....	0	0
24....	10.00	.....	333	34	147	17	4	.....	0	0
	12.00	.....	334	110	84	8	5	.....	0	+
	.....	4.00	335	51	64	8	9	.....	0	0
25....	10.00	.....	336	20	86	7	4	.....	0	0
	12.00	.....	337	26	65	5	2	.....	0	0
27....	10.00	.....	338	37	56	3	0	.....	0	0
	12.00	.....	339	23	16	1	2	.....	0	—
	.....	4.00	340	40	53	3	3	.....	0	0
28....	10.00	.....	341	52	15	6	2	Strips added to filters, and thrown up and contaminated by boats, etc.	0	0

Continued.

FILTER.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	—	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	.....	—	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0

APPENDIX A—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
June 28....	12.00	.....	342	16	23	1	1	.....	0	+
	.....	4.00	343	14	14	10	0	*end of contamination	0	0
29....	10.00	.....	344	16	6	0	1		0	0
	12.00	.....	345	21	4	0	2		0	—
	.....	4.00	346	—	—	2	2		0	—
30....	10.00	.....	347	7	6	3	4		—	0
	12.00	.....	348	7	9	2	2	.....	+	—
	.....	4.00	349	15	3	3	2	.....	0	—
July 4....	12.00	.....	350	145	25	66	0	.....	+	+
	.....	4.00	351	32	16	1	1	.....	—	+
5....	10.00	.....	352	145	11	45	5	.....	—	+
	12.00	.....	353	400	30	90	4	.....	0	+
	.....	4.00	354	190	15	30	3	.....	0	+
6....	10.00	.....	355	430	18	23	2	91.5	0	+
				139.2	13.7	24.0	2.4	90.0		
July 6....	.....	4.00	356	18	13	9	2	.....	—	—
7....	10.00	.....	357	175	6	33	2	.....	0	+
	12.00	.....	358	110	8	3	0	.....	—	—
	.....	4.00	359	90	14	3	4	.....	0	+
8....	10.00	.....	360	42	20	6	3	.....	0	0
	12.00	.....	361	50	5	3	0	.....	0	—
	.....	4.00	362	44	21	21	4	.....	0	0
9....	10.00	.....	363	28	7	1	2	.....	0	0
	12.00	.....	364	325	12	165	0	.....	+	+
*11....	12.00	.....	365	115	46	4	6	.....	0	+
	.....	4.00	366	110	15	4	2	.....	0	—
12....	10.00	.....	367	80	—	9	1	.....	0	0
	12.00	.....	368	94	11	12	11	.....	—	—
	.....	4.00	369	31	23	6	3	.....	0	+
13....	10.00	.....	370	28	7	3	1	.....	—	—
	12.00	.....	371	21	9	8	1	.....	0	—
	.....	4.00	372	65	14	6	2	.....	0	0
14....	10.00	.....	373	60	5	15	3	.....	0	0
	12.00	.....	374	60	13	10	1	.....	0	+
	.....	4.00	375	68	6	20	3	.....	0	0
15....	10.00	.....	376	230	17	10	2	.....	0	+
	12.00	.....	377	96	11	3	0	.....	0	0
	.....	4.00	378	17	7	6	2	.....	—	—
16....	10.00	.....	379	140	3	35	1	.....	+	+
	12.00	.....	380	280	2	5	6	87.0	+	+
				95.0	12.3	17.8	2.5	85.8		
July 18....	.....	4.00	381	36	14	1	3	.....	0	+
19....	10.00	.....	382	67	9	6	3	.....	0	+
	12.00	.....	383	—	—	13	3	.....	0	0
	.....	4.00	384	100	4	12	1	.....	0	0
20....	10.00	.....	385	170	9	3	2	.....	+	—
	12.00	.....	386	126	4	80	3	.....	+	+
	.....	4.00	387	84	7	19	1	.....	0	+
21....	10.00	.....	388	115	5	45	4	.....	—	+
	12.00	.....	389	120	3	21	7	.....	—	0
	.....	4.00	390	120	5	64	1	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
—	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	0
—	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	0	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	0	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	—
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	—	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	—	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0

APPENDIX A—

SAND

TANK "B"—Rate 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
July 22....	10.00	.....	391	100	4	9	4	.....	0	0
	12.00	.....	392	125	1	11	1	.....	0	0
	.....	4.00	393	70	6	10	0	.....	+	+
23....	10.00	.....	394	70	1	3	3	.....	0	0
	12.00	.....	395	70	2	2	2	94.6	+	+
				98	5.3	19.9	2.5	87.4		
July 26....	.....	4.00	396	62	50	10	2	.....	0	+
27....	10.00	.....	397	95	2	12	6	.....	.....	.....
	12.00	.....	398	18	2	4	3	.....	.....	.....
	.....	4.00	399	145	8	—	7	.....	0	0
28....	10.00	.....	400	10	3	6	5	.....	0	+
	12.00	4.00	401	145	2	11	2	.....	.....	.....
	.....	4.00	402	175	5	91	3	.....	+	+
29....	10.00	.....	403	65	6	7	1	.....	0	0
	12.00	.....	404	39	6	4	4	.....	0	0
30....	10.00	.....	405	350	14	3	3	.....	0	0
Aug. 2....	10.00	.....	406	10	5	7	2	.....	.....	.....
	12.00	.....	407	6	3	9	2	90.5	.....	.....
				93.4	8.8	14.9	3.3	77.9		
4....	10.00	.....	408	7	7	2	3	.....	.....	0
	12.00	.....	409	39	0	27	1	.....	.....	0
5....	10.00	.....	410	181	4	4	0	.....	0	0
	12.00	.....	411	91	2	0	0	.....	.....	0
6....	10.00	.....	412	24	0	1	0	.....	.....	.....
	12.00	.....	413	40	1	—	0	.....	.....	.....
8....	10.00	.....	414	80	3	0	1	.....	.....	.....
	12.00	.....	415	102	0	—	0	.....	.....	.....
9....	10.00	.....	416	43	2	1	—	.....	.....	.....
	12.00	.....	417	99	0	1	0	.....	.....	.....
10....	10.00	.....	418	13	0	1	1	.....	0	0
	12.00	.....	419	23	0	0	0	.....	0	0
11....	10.00	.....	420	58	1	47	1	.....	0	0
	12.00	.....	421	58	2	17	0	.....	0	—
12....	10.00	.....	422	49	5	65	4	.....	—	0
	12.00	.....	423	52	2	20	2	.....	0	0
13....	10.00	.....	424	121	1	4	1	.....	0	0
	12.00	.....	425	93	0	1	0	.....	0	0
15....	10.00	.....	426	13	1	2	1	97.1	0	0
				57.1	1.6	11.4	.8	93.0		
16....	12.00	.....	427	17	1	0	0	.....	0	0
17....	12.00	.....	428	137	1	2	3	.....	0	0
18....	10.00	.....	429	127	3	10	5	.....	0	—
	12.00	.....	430	93	1	2	0	98.5	0	—
				93.5	1.5	3.5	2	42.8		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	.....	.....	0
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0	.....	0	+	.....	.....	.....	.....	0	.....	.....	0	.....	.....
0	.....	0	0	.....	.....	.....	.....	0	.....	.....	0	.....	.....
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0	.....	.....	+	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	+
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	+
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	0	.....	+
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
+	.....	.....	0	.....	.....	0	0	0	.....	.....	0	.....	.....
0	.....	.....	0	.....	—	0	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	0	.....	.....	0	.....	0

APPENDIX A—

SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1910	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Aug. 30....	10.00	.....	431	233	78	12	64	.....	0	—
	12.00	.....	432	900	50	90	29	.....	—	—
31....	10.00	.....	433	140	20	8	9	.....	0	0
	12.00	.....	434	130	19	31	20	.....	+	+
	.....	4.00	435	60	19	4	36	.....	0	—
Sept. 1....	10.00	.....	436	280	11	34	10	.....	—	+
	12.00	.....	437	140	10	21	15	.....	+	+
2....	10.00	.....	438	1,440	68	7	14	.....	0	+
	12.00	.....	439	185	130	24	13	.....	+	+
	.....	4.00	440	164	52	36	27	.....	+	+
3....	10.00	.....	441	24	23	4	3	.....	0	+
	12.00	.....	442	18	23	6	4	.....	+	+
6....	10.00	.....	443	290	—	63	5	.....	.....	+
	12.00	.....	444	18	9	2	4	.....	.....	0
	.....	4.00	445	36	15	3	—	.....	—	+
7....	10.00	.....	stop'd	270.5	37.6	25	18.0			
8....	10.00	.....	446	108	9	24	6	.....	+	+
	12.00	.....	447	62	150	11	—	.....	0	+
	.....	4.00	448	—	34	4	22	.....	0	+
9....	10.00	.....	449	310	13	47	26	.....	—	+
	12.00	.....	450	224	25	32	10	.....	+	+
	.....	4.00	451	116	20	45	20	.....	+	+
10....	10.00	.....	452	265	13	17	12	.....	+	+
	12.00	.....	453	77	14	25	13	.....	+	+
12....	10.00	.....	454	520	14	10	9	.....	+	+
	12.00	.....	455	600	7	240	5	.....	.....	.....
13....	10.00	.....	456	588	7	7	9	.....	.....	.....
14....	10.00	.....	457	2,000	32	80	36	.....	+	+
14....	12.00	.....	458	1,200	145	54	130	.....	+	+
	.....	4.00	459	900	31	25	1	.....	+	+
15....	10.00	.....	460	12	5	1	10	.....	+	+
	12.00	.....	461	16	10	3	2	.....	+	+
	.....	4.00	462	28	9	12	8	.....	+	+
16....	10.00	.....	463	32	10	7	10	.....	0	+
	12.00	.....	464	9	4	—	—	.....	0	+
	.....	4.00	465	16	5	4	4	.....	—	+
17....	10.00	.....	466	12	1	—	1	.....	—	+
19....	10.00	.....	467	73	8	15	5	.....	—	+
	12.00	.....	468	23	8	11	4	.....	+	—
	.....	4.00	469	103	5	4	3	.....	+	+
20....	10.00	.....	470	35	5	3	2	.....	0*	0
	.....	.....	stop'd	301.2	23	29.6	15.1	.....	.....	.....
23....	12.00	.....	471	320	91	2	43	.....	0	0
25....	12.00	.....	472	43	2	—	5	.....	—	+
26....	12.00	.....	473	—	—	—	4	.....	0	—
27....	.....	4.00	474	—	—	3	3	.....	0	—
28....	.....	12.00	475	536	29	44	2	.....	—	+
29....	.....	5.00	476	590	4	—	3	.....	0	—
30....	.....	5.00	477	710	1	69	2	.....	0	0
Oct. 1....	12.00	.....	478	51	1	45	10	.....	0	0
3....	.....	10.00	stop'd	375	21.3	32.6	9			

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	—	+
0	.....	.....	—	.....	+	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	—	.....	+
0	.....	.....	+	.....	—	.....	.....	.....	.....	.....	0	.....	—
+	.....	.....	+	.....	—	.....	+	+	.....	.....	—	.....	+
+	.....	.....	+	.....	+	.....	—	+	.....	.....	+	.....	—
+	.....	.....	+	.....	+	.....	+	—	.....	.....	—	.....	—
+	.....	.....	+	.....	+	.....	0	—	.....	.....	+	.....	+
—	.....	.....	+	.....	+	.....	0	0	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	—	.....	.....	—	.....	+
.....	.....	.....	—	.....	+	.....	+	.....	.....	.....	—	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	—
+	.....	.....	+	.....	+	.....	—	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	0	0	+	.....	.....	—	.....	—
+	.....	.....	+	.....	+	—	+	—	.....	.....	+	.....	+
+	.....	.....	+	.....	+	+	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	.....	0	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	.....	.....	+	+	.....	.....	+	.....	.....
+	.....	+	.....	.....	.....	—	+	.....	+	.....	.....	.....	.....
.....	.....	.....	+	.....	+	.....	0	.....	.....	.....	—	.....	.....
.....	.....	.....	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+
.....	+	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	+	.....	+	.....	+	.....	—	0	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	—	.....	.....	—	.....	.....
+	.....	.....	+	.....	+	.....	—	—	.....	.....	—	.....	.....
+	.....	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	+	+	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	0	—	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
—	.....	.....	+	.....	.....	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	.....	.....	0	0	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	.....	0	.....	—	.....	0
.....	0	.....	0	.....	0	.....	*0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	+	.....	+	.....	+
.....	+	.....	+	.....	+	.....	0	.....	+	.....	0	.....	0
.....	—	.....	+	.....	—	.....	0	.....	0	.....	—	.....	+
.....	+	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
.....	+	.....	+	.....	+	.....	0	.....	0	.....	+	.....	0
.....	+	.....	+	.....	+	.....	+	.....	0	.....	+	.....	+
.....	0	.....	+	.....	+	.....	0	.....	0	.....	+	.....	0
.....	—	.....	—	.....	+	.....	.....	.....	—	.....	—	.....	0

APPENDIX A—

SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
3....	.....	5.00	479	247	16	5	19	.....	0	0
4....	.....	4.00	480	30	2	55	3	.....	.....	0
5....	12.00	.....	481	21	3	35	4	.....	.....	0
6....	12.00	.....	482	34	1	6	4	.....	.....	+
Oct. 7....	12.00	.....	483	141	4	13	2	.....	.....	+
8....	12.00	.....	484	145	5	1	1	.....	.....	0
10....	12.00	.....	485	153	6	2	9	.....	.....	0
11....	.....	4.00	486	200	4	2	4	.....	.....	.....
12....	12.00	.....	487	71	6	0	3	.....	0	0
13....	12.00	.....	488	28	7	3	2	.....	0	0
14....	12.00	.....	489	156	6	2	2	.....	0	0
15....	12.00	.....	490	71	4	6	2	.....	0	0
17....	.....	5.00	491	388	3	3	1	.....	0	+
18....	.....	5.00	492	180	4	9	2	.....	0	+
19....	.....	5.00	493	800	14	900	5	.....	0	0
20....	10.00	.....	494	640	3	50	2	.....	0	+
21....	.....	4.00	495	1,200	—	359	0	.....	—	—
22....	10.00	.....	stop'd	265.0	5.1	85.3	3.8			

RATE 10,000,000 GALLONS

Oct. 24....	.....	4.00	496	240	16	6	2	.....	0	+
25....	10.00	.....	497	130	2	3	1	.....	0	—
26....	10.00	.....	498	196	2	5	1	.....	0	—
27....	12.00	.....	499	—	—	8	5	.....	0	0
28....	.....	5.00	500	37	48	9	33	.....	0	0
29....	12.00	.....	501	59	80	7	3	.....	0	0
Nov. 1....	10.00	.....	502	75	25	4	2	.....	0	0
4....	.....	3.00	503	150	70	7	4	.....	0	0
5....	10.30	.....	504	52	55	6	11	.....	0	0
				117.4	37.2	6.1	6.6			
8....	11.30	.....	505	2	2,000	0	0	.....	0	0
9....	10.00	.....	506	1	2,000	3	4	.....	0	0
10....	10.00	.....	507	186	1,000	9	3	.....	0	0
			stop	63	1666.6	4.0	3.5			

RATE 3,000,000 GALLONS

Nov. 12....	12.00	.....	508	12	2,000	3	6	.....	0	0
14....	10.00	.....	509	2	600	5	1	.....	0	0
15....	11.00	.....	510	0	300	2	3	.....	0	0
16....	12.00	.....	511	0	300	1	1	.....	0	0
17....	.....	5.00	512	0	155	0	1	.....	0	0
18....	11.30	.....	513	3	500	1	1	.....	0	0
19....	10.30	.....	514	0	800	1	1	.....	0	0
21....	.....	5.00	515	5	384	1	3	.....	0	0
22....	10.00	.....	516	8	119	8	4	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c.	1 c.c.	5 c.c.	10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+
.....	0	.....	—	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	+	.....	.....	.....	0	.....	0	.....	+
.....	0	.....	.....	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	+	.....	+	.....	.....	.....	0	.....	—	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
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0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
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.....	.....	.....	.....	.....	+	.....	.....	media	strip	.....	.....	.....	.....
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.....	0	.....	0	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	+	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0

PER ACRE PER DAY.

.....	+	.....	+	.....	+	0	0	.....	0	.....	0	.....	0
.....	—	.....	+	.....	+	0	0	.....	0	.....	—	.....	+
.....	0	.....	—	.....	0	0	0	.....	0	.....	0	.....	0
.....	—	.....	0	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	—	.....	0	.....	—
.....	—	.....	—	.....	+	0	—	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	—	.....	+	0	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	—	0	0	.....	—	.....	0	.....	0
.....	0	.....	0	.....	+	0	—	.....	0	.....	+	.....	—

PER ACRE PER DAY.

.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
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.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	0	.....	0

APPENDIX A—

SAND

TANK "B"—RATE 3,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour.		Serial No.	Bacterial Counts.				Bact. Eff'cy.	Influent.	
				18°–22°C.		37.5°C.				
	A.M.	P.M.		Inf.	Eff.	Inf.	Eff.		1 C.C.	5 C.C.
1910										
Nov. 23....	.....	4.00	517	6	59	29	26	.....	0	0
24....	.....	5.00	518	1	246	1	0	.....	0	0
25....	10.30	.....	519	9	129	0	0	.....	0	0
26....	.....	1.00	520	5	195	4	6	.....	0	0
28....	10.00	.....	521	—	—	1	1	.....	0	0
29....	10.00	.....	522	—	—	11	3	.....	0	0
Dec. 1....	.....	5.00	523	2	5	2	1	.....	0	0
	.....	.....	stop	3.7	413.7	4.3	3.6			
3....	12.30	.....	524	16	86	10	43	.....	0	0
5....	.....	4.00	525	22	181	6	3	.....	0	0
6....	10.00	.....	526	7	32	2	1	.....	0	0
7....	.....	4.00	527	56	15	4	1	.....	0	0
8....	.....	3.30	528	11	5	3	1	.....	0	0
9....	.....	4.30	529	15	73	4	0	.....	.....	.....
10....	11.30	.....	530	100	11	—	—	.....	.....	.....
14....	.....	3.00	531	32	42	2	1	.....	0	0
15....	.....	5.30	532	22	41	5	3	.....	0	0
16....	.....	5.00	533	13	6	1	1	.....	0	0
19....	.....	4.00	534	45	25	2	1	.....	0	+
22....	.....	4.00	535	53	4	0	1	.....	0	0
27....	.....	4.00	536	50	15	—	0	.....	0	0
30....	.....	4.00	537	458	22	6	5	.....	0	0
Jan. 3 1911	.....	5.00	538	0	6	2	1	.....	+	0
				60.0	37.6	3.6	4.4			

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	—	.....	0
....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.... .	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	—	.....	—	.....	+	.....	.....	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	+	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	+	.....	0	.....	0
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.....	0	.....	—	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	+	.....	0	.....	.....	.....	0	.....	—	.....	0
.....	0	.....	+	.....	0	.....	.....	.....	0	.....	0	.....	+
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	+	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—

APPENDIX A—

SAND

TANK "C"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read. 6	Max. Loss of Head.	Bacterial Counts. 18°–22°C. Inf.	Bacterial Counts. 18°–22°C. Eff.	Eff'cy. Bact.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Sept. 15....	10.20	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	10.30	.....	1	.....	.....	90	40	.....	.....	.....
	12.00	.....	2	.....	.....	120	60	.....	.....	.....
	.....	4.00	3	.....	.....	310	36	.....	.....	.....
16....	9.30	.....	4	1.35	1.35	230	23	.....	.....	.....
	12.00	.....	5	.....	.....	170	56	.....	.....	.....
	.....	4.00	6	.....	.....	70	32	.....	.....	.....
17....	9.30	.....	7	.....	.....	520	64	.....	.....	.....
	12.00	.....	8	.....	.....	180	31	.....	.....	.....
	.....	3.45	9	1.9	1.9	70	34	.....	.....	.....
18....	9.30	.....	10	.....	.....	330	16	.....	.....	.....
	12.00	.....	11	2.2	2.2	—	—	.....	.....	.....
20....	11.00	.....	stop	3.3	3.3	209	39.2	.....	.....	81.2
		4.00	start	0.0	0.0	.....	.....	.....	.....	.....
20....	.....	4.15	13	.....	.....	150	48	.....	.....	.....
21....	9.30	.....	14	.....	.....	160	7	.....	.....	.....
	12.00	.....	15	.....	.....	80	3	.....	.....	.....
	4.00	.....	16	2.1	2.1	148	6	.....	.....	.....
22....	9.30	.....	17	2.15	2.15	560	81	.....	.....	.....
	12.00	.....	18	.....	.....	250	4	.....	.....	.....
	.....	2.10	stop	3.3	3.3	224.6	24.8	.....	.....	88.9
22....	.....	5.30	start	0.0	0.0	.....	.....	.....	.....	.....
23....	9.30	.....	20	.....	.....	350	30	.....	.....	.....
	12.00	.....	21	.....	.....	160	10	.....	.....	.....
	.....	4.15	22	.....	.....	400	2	.....	.....	.....
24....	9.45	.....	23	2.0	2.0	540	10	.....	.....	.....
	12.00	.....	24	.....	.....	250	10	.....	.....	.....
	.....	4.00	25	.....	.....	430	—	.....	.....	.....
25....	9.30	.....	26	2.2	2.2	390	9	.....	.....	.....
25....	12.00	.....	27	.....	.....	24,000	1	.....	.....	.....
	.....	4.00	28	.....	.....	299	4	.....	.....	.....
27....	8.30	.....	stop	3.3	3.3	2,979.8	8.4	.....	.....	99.8
	.....	12.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	31	.....	.....	490	1	.....	.....	.....
28....	9.30	.....	32	2.1	2.1	1,180	2	.....	.....	.....
	12.00	.....	33	.....	.....	920	3	.....	.....	.....
	.....	4.00	34	.....	.....	730	6	.....	.....	.....
29....	9.30	.....	35	2.1	2.1	1,200	3	.....	.....	.....
	.....	4.00	36	.....	.....	110	1	.....	.....	.....
30....	9.30	.....	37	3.0	3.0	310	3	.....	.....	.....
	12.00	.....	38	.....	.....	1,300	8	.....	.....	.....
	.....	4.00	43	.....	.....	214	7	.....	.....	.....
	.....	5.00	stop	3.3	3.3	717.1	3.7	.....	.....	99.4
Oct. 1....	11.05	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	11.15	.....	45	.....	.....	120	80	.....	.....	.....
	11.30	.....	46	.....	.....	76	38	.....	.....	.....
	11.45	.....	47	.....	.....	380	16	.....	.....	.....
	12.00	.....	48	.....	.....	257	13	.....	.....	.....
	.....	4.00	49	1.8	1.8	170	5	.....	.....	.....
2....	9.30	.....	50	.....	.....	73	0	.....	.....	.....
	12.00	.....	51	1.6	1.6	76	4	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C

APPENDIX A—

SAND

TANK "C"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 6	Max. loss of head.	Bacterial counts. 18°-22°C Inf.	Bacterial counts. 18°-22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Oct. 4....	12.00	.....	52	.....	.....	140	12	.....	.....	.....
	.....	4.00	53	2.0	2.0	157	6	.....	.....	.....
5....	9.30	.....	54	2.5	2.5	200	2	.....	.....	.....
	12.00	.....	55	2.5	2.5	112	2	.....	.....	.....
	.....	4.00	56	2.65	2.65	173	2	.....	.....	.....
6....	9.30	.....	57	3.3	3.3	440	2	.....	.....	.....
	9.45	.....	stop	.....	.....	182.6	14	92.4		
	.....	3.30	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	59	1.55	1.55	260	10	.....	+	+
7....	9.30	.....	60	1.5	1.5	270	2	.....	+	+
	12.00	.....	61	1.5	1.5	220	5	.....	—	+
	.....	4.00	62	1.4	1.4	220	2	.....	—	+
8....	9.30	.....	63	1.3	1.3	940	12	.....	.....	.....
	12.00	.....	64	1.3	1.3	290	15	.....	.....	.....
	.....	4.00	65	1.3	1.3	940	20	.....	+	+
9....	9.30	.....	66	1.3	1.3	200	3	.....	.....	.....
	12.00	.....	67	1.3	1.3	400	3	.....		+
11....	9.30	.....	68	1.75	1.75	560	1	.....	—	—
	12.00	.....	69	1.8	1.8	150	10	.....	—	+
	.....	4.00	70	1.8	1.8	89	0	.....	—	+
12....	9.30	.....	71	2.05	2.05	144	0	.....	—	+
	12.00	.....	72	2.1	2.1	151	0	.....	—	+
	.....	4.00	73	2.25	2.25	157	0	.....	+	+
13....	9.30	.....	74	2.7	2.7	151	0	.....	—	+
	12.00	.....	75	2.8	2.8	134	3	.....	+	+
	.....	4.00	76	2.9	2.9	51	10	.....	+	+
14....	9.30	.....	77	4.25	4.25	200	1	.....	—	+
	9.30	.....	stop	.....	.....	290.8	5.1	97.9		
15....	.....	12.15	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	82	1.6	1.6	240	5	.....	.....	.....
16....	9.30	.....	83	1.5	1.5	70	7	.....	.....	.....
	12.00	.....	84	1.5	1.5	202	800	.....	.....	.....
18....	12.00	.....	85	1.5	1.5	220	1	.....	.....	.....
	.....	3.30	86	1.6	1.6	129	3	.....	.....	.....
19....	9.30	.....	87	2.0	2.0	160	2	.....	.....	.....
	12.00	.....	88	.....	.....	330	4	.....	.....	.....
19....	.....	4.00	89	2.1	2.1	460	1	.....	.....	.....
20....	9.30	.....	90	2.6	2.6	170	0	.....	.....	.....
	12.00	.....	91	2.75	2.75	1,200	2	.....	.....	.....
	.....	3.30	stop	3.3	3.3	318.1	82.5	74.0		
21....	11.15	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	94	1.9	1.9	920	60	.....	.....	.....
	.....	4.00	95	1.8	1.8	1,440	23	.....	.....	.....
22....	9.00	.....	stop	3.3	3.3	1,180	41.5	96.5		
26....	.....	3.30	start	0.0	0.0	.....	2	.....	.....	.....
	.....	4.00	96	2.1	2.1	160	18	.....	—	+
27....	9.30	.....	97	1.5	1.5	91	2	.....	—	+
	12.00	.....	98	1.35	1.35	60	4	.....	—	+
	.....	4.00	99	1.3	1.3	40	6	.....	+	—
28....	12.00	.....	100	1.1	1.1	35	4	.....	—	+
	.....	3.00	101	1.1	1.1	60	1	.....	—	—
29....	.....	3.00	102	1.2	1.2	60	5	.....	—	+

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	—	+	+	+	+	+
						—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	+	—	—	+	+	+
+	+	+	+	+	+	+	—	+	—	+	+	+	+
+	+	+	+	+	+	—	—	—	—	—	—	+	+
+	+	+	+	+	+	—	—	—	+	—	—	—	—
+	+	+	+	+	+	—	—	—	—	—	—	—	+
+	+	+	+	+	+	—	+	+	—	—	+	+	+
+	+	+	+	+	+	—	—	—	—	—	—	+	+
+	+	+	+	+	+	—	—	—	—	+	—	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	—	—	+	+	+	—
+	—	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	+		+	—	—	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
+	+	+	+	+	+	—	+		+	—	+	+	+
+	+	+	+	+	+	—	—	+	+	—	+	+	+
+	+	+	+	+	+	—	—	+	—	—	+	+	+
+	+	+	+	+	+	—	—		—	+	+	—	

APPENDIX A—
SAND

TANK "C"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read.	Max. Loss of Head.	Bacterial Counts. 18°–22°C Inf.	Bacterial Counts. 18°–22°C Eff.	Eff'cy. Bact.	Influent. 1 C. C.	Influent. 5 C. C.
1909										
Oct. 30....	9.30	.....	103	1.4	1.4	55	2	.....	+	+
	12.00	.....	104	1.5	1.5	80	4	.....	.....	.....
Nov. 1	9.30	.....	105	2.5	2.5	130	0	.....	.....	.....
	12.00	.....	106	3.0	3.0	60	9	.....	.....	.....
	.....	3.00	107	3.0	3.0	30	—	.....	.....	.....
	.....	5.00	stop	3.3	3.3	71.7	5.4	92.4		
5....	9.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	9.30	.....	109	1.5	1.5	70	9	.....	.....	.....
	12.00	.....	110	1.4	1.4	60	2	.....	.....	.....
	.....	3.00	111	1.4	1.4	35	8	.....	.....	.....
6....	9.30	.....	112	1.15	1.15	40	1	.....	.....	.....
	12.00	.....	113	1.1	1.1	110	3	.....	.....	.....
8....	12.00	.....	114	1.0	1.0	55	0	.....	.....	.....
	.....	4.00	115	1.1	1.1	85	1	.....	.....	.....
9....	10.00	.....	116	1.4	1.4	100	9	.....	.....	.....
	12.00	.....	117	1.5	1.5	75	6	.....	.....	.....
	.....	4.00	118	1.2	1.7	65	5	.....	.....	.....
10....	9.30	.....	stop	3.3	3.3	69.5	4.4	93.7		
11....	12.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	3.30	124	1.7	1.7	35	1	.....	—	—
12....	9.30	.....	125	1.4	1.4	40	3	.....	+	—
	.....	3.00	126	1.5	1.5	125	27	.....	—	—
13....	9.30	.....	127	1.6	1.6	85	4	.....	—	—
	12.00	.....	128	1.7	1.7	90	14	.....	—	—
15....	9.30	.....	129	3.2	3.2	21	1	.....	—	—
	12.00	.....	130	3.3	3.3	75	42	.....	—	—
	12.00	.....	stop	.....	.....	67.2	13.1	80.6		
16....	.....	2.00	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	3.30	133	1.5	1.5	100	7	.....	—	—
17....	12.00	.....	134	1.5	1.5	430	—	.....	—	—
	.....	4.00	135	1.5	1.5	800	25	.....	+	+
18....	9.30	.....	136	1.8	1.8	250	7	.....	—	+
	12.00	.....	137	1.8	1.8	90	12	.....	—	+
	.....	4.00	138	1.9	1.9	125	6	.....	+	+
19....	9.30	.....	139	2.1	2.1	280	—	.....	.....	.....
	12.00	.....	140	2.2	2.2	165	6	.....	.....	.....
22....	.....	3.00	stop	3.3	3.3	280	8	97.2		
27....	10.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
29....	9.30	.....	147	.....	.....	620	30	.....	+	+
	12.00	.....	148	.....	.....	470	20	.....	—	+
	.....	4.00	149	.....	.....	300	52	.....	—	+
30....	9.30	.....	150	.....	.....	330	17	.....	—	+
Dec. 1....	9.30	.....	151	9.0	4.	.....	.....	.....	—	—
	9.30	.....	stop	36.2	24.6	.....	.....	93.2		
3....	9.30	.....	start	.....	.....	.....	.....	.....	.....	.....
3....	9.30	.....	155	450	109	.....	.....	.....	.....	.....
4....	9.30	.....	156	85	15	.....	.....	.....	.....	.....
6....	9.30	4.30	157	—	—	.....	.....	.....	.....	.....
	.....	4.30	158	—	—	.....	.....	.....	.....	.....
7....	9.30	.....	stop	267.5	62.0	.....	.....	76.8		

New Sand placed in filters

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
—	+	+	+	+	+	—	+	—	—	—	+	+	
+	+	—	+	+	+	—	—	—	—	+	+	—	+
+	+	+	+	+	+	—	—	—	+	—	—	—	+
—	+	+	+	+	—	—	—	+	—	+	+	+	—
—	—	—	—	—	—	—	—	—	+	—	—	—	—
+	+	+	+	—	—	—	—	—	—	—	—	—	—
—	+	+	—	—	—	—	—	+	+	+	+	—	—
+	—	—	—	—	+	—	—	+	+	+	—	—	+
—	+	+	—	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	—	—	+	—	+	+	—
+	+	+	+	+	+	—	—	—	+	+	—	—	
+	+	+	+	+	+	—	+	+	+	+	+	+	—
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	—	+	+	—	—	
						—	—	+	—	—	—	+	—
+	+	+	+	+	+	—	—	+	—	—	—	+	—
+	+	+	+	+	+	—	+	—	+	—	—	+	+
+	+	+	+	+	+	—	+	—	—	+	+	+	+
—	+	+	—	+	—	—	—	+	+	—	—	—	—
—	+	+	—	—	—	—	—	—	—	+	—	+	—

20 cu. yds. received Jan. 28th, 1911.

APPENDIX A—
SAND

TANK "C"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1910	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 1	2	3	4	5	6	Max. loss of head.	Bacterial counts. 18°-22°C Inf.	18°-22°C Eff.	37.5°C Inf.	37.5°C Eff.	Bact. Eff'cy.
Feb. 15	.....	3.20	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
16	9.30	.....	stop	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
17	12.30	.....	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
18	9.30	.....	stop	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
19	9.30	.....	stop	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
21	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
22	9.00	.....	stop	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
23	.....	3.30	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	.....	4.00	179	...	...	...	...	...	...	...	110	38	0 0	0 0	.....
24	9.30	.....	stop	...	...	...	...	...	...	...	110	38	.....	.....	65.5
Mar. 7	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
8	10.30	.....	206	4.0	3.5	2.9	1.7	.8	.3	3.7	6,880	84	.....	.....	.....
	10.00	.....	stop	...	...	...	...	...	...	...	6,880	84	.....	.....	98.8
	.....	5.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
9	10.00	.....	209	3.7	3.4	2.7	1.3	.7	.2	3.5	3,980	710	.....	.....	.....
	11.00	.....	stop	...	...	...	...	...	...	...	3,980	710	.....	.....	82.2
11	9.30	.....	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	10.00	.....	215	3.6	3.4	2.7	1.4	.6	.2	3.4	780	665	.....	.....	.....
	12.00	.....	216	3.6	3.6	2.7	1.6	.7	.2	3.4	390	367	.....	.....	.....
	.....	4.00	217	3.5	3.5	2.6	1.5	.7	.2	3.3	1,070	237	4 0	5 1	.....
12	10.00	.....	218	3.2	3.2	2.2	1.2	.7	.2	3.0	300	117	.....	.....	.....
	12.00	.....	219	3.2	3.1	2.1	1.2	.7	.2	3.0	390	115	.....	.....	.....
14	10.00	.....	220	2.7	2.7	2.3	1.8	1.2	.2	2.5	500	61	.....	.....	.....
	12.00	.....	221	2.8	2.8	2.3	1.8	1.2	.2	2.6	150	28	.....	.....	.....
	.....	4.00	222	2.9	2.9	2.4	1.9	1.4	.2	2.7	156	27	24 2	18 2	.....
15	10.00	.....	223	3.1	3.1	2.6	2.2	1.7	.2	2.9	760	162	.....	.....	.....
	12.00	.....	224	3.1	3.1	2.7	2.2	1.7	.2	2.9	1,070	390	.....	.....	.....
	.....	4.00	225	3.3	3.3	2.9	2.4	1.8	.3	3.0	1,430	538	18 1	6 0	.....
16	9.30	.....	stop	...	...	...	...	...	...	...	636	246	.....	.....	61.3
	.....	5.00	start	2.5	2.5	2.0	1.5	.8	.2	2.3	.....	.....	.....	.....	.....
17	10.00	.....	229	2.5	2.5	2.0	1.5	.8	.2	2.3	90	44	.....	.....	.....
	12.00	.....	230	2.5	2.5	2.0	1.5	.8	.2	2.3	360	54	.....	.....	.....
	.....	4.00	231	2.5	2.5	2.0	1.5	.7	.2	2.3	3,200	170	38 3	2 0	.....
18	10.00	.....	232	2.2	2.2	1.8	1.5	.9	.2	2.0	920	312	.....	.....	.....
	12.00	.....	233	2.2	2.2	1.8	1.5	.9	.2	2.0	279	218	.....	.....	.....
	.....	4.00	234	2.1	2.1	1.8	1.5	.9	.2	1.9	610	141	6 0	3 0	.....
19	10.00	.....	235	2.2	2.2	1.8	1.8	1.0	.2	2.0	850	103	.....	.....	.....
21	10.00	.....	236	3.4	3.4	3.0	2.4	1.9	.2	3.2	250	86	.....	.....	.....
	12.00	.....	237	3.4	3.4	3.0	2.4	2.0	.2	3.2	960	49	.....	.....	.....
	.....	4.00	stop	...	...	...	...	...	...	...	836	131	.....	.....	84.3
23	.....	1.00	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	.....	4.00	244	...	...	...	...	...	...	...	70	5	6 0	2 0	.....
29	9.00	.....	stop	2.7	2.7	2.1	1.4	.4	.2	2.5	70	5	.....	.....	92.8
April 6	11.00	.....	start	...	...	...	...	...	...	...	.....	.....	.....	.....	.....
	12.00	.....	251	...	...	...	...	...	...	...	12	21	.....	.....	.....
	.....	4.00	252	...	...	...	...	...	...	...	15	10	.....	.....	.....
7	10.00	.....	253	...	...	...	...	...	...	...	240	15	.....	.....	.....
	12.00	.....	254	...	...	...	...	...	...	...	80	46	.....	.....	.....
	.....	4.00	255	...	...	...	...	...	...	...	35	27	.....	.....	.....
8	10.00	.....	256	...	...	...	...	...	...	...	87	31	.....	.....	.....
	12.00	.....	257	...	...	...	...	...	...	...	28	22	.....	.....	.....
	.....	4.00	258	...	...	...	...	...	...	...	38	21	.....	.....	.....
9	10.00	.....	259	...	...	...	...	...	...	...	3	0	.....	.....	.....
	11.00	.....	stop	...	...	...	...	...	...	...	60	21.4	.....	.....	64.3

These results misleading since sand on filters had been removed

Continued.
FILTERS.
PER ACRE PER DAY.

Colon Bacilli.

Influent.							Effluent.						
1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	.	.	+	.....	.....	+	+	+	+	+	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	-	-	+	.....	.....	+	+	+	+	+	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	+	—	0	.....	.....	0	+	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	0	+	+	.....	.....	0	0	0	+	+	.....	.....
0	0	+	+	+	.....	.....	0	+	+	0	0	.....	.....
0	0	0	0	0	.....	.....	0	+	0	—	—	.....	.....
0	0	0	0	0	.....	.....	0	0	0	+	+	.....	.....
+	+	+	+	+	.....	.....	—	+	—	+	+	.....	.....
+	+	+	+	+	.....	.....	—	+	+	+	+	.....	.....
0	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	—	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
—	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	-	+	+	.....	.....	0	+	—	+	+	.....	.....
0	+	+	0	+	.....	.....	0	+	0	—	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	+	+	+	+	+	.....	.....
0	+	0	+	+	.....	.....	0	0	+	+	+	.....	.....
0	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
+	+	+	+	+	.....	.....	0	+	+	+	+	.....	.....
0	0	+	+	+	.....	.....	0	0	+	+	0	.....	.....
+	+	+	+	+	.....	.....	0	0	0	0	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	—	+	.....	.....	0	+	0	—	0	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	+	0	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	.....	.....	0	0	0	0	0	.....	.....
—	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
0	+	+	+	+	.....	.....	0	0	0	0	0	.....	.....
0	0	0	0	0	0	—	0	0	0	0	0	.....	0
0	0	0	0	0	.....	0	.....	.....	0	0	0	.....	0
0	0	0	0	0	.....	0	.....	.....	0	0	0	.....	0
0	0	0	0	0	.....	0	.....	.....	0	0	0	.....	0
0	+	+	+	+	.....	+	.....	.....	0	0	0	.....	0

and washed by dirty Toronto water, then replaced.

APPENDIX A—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
May, 11....	12.00	.....	1	.....	9	22	14	.....	.....	.....
	.....	4.00	2	38	15	.....	53	.....	.....	.....
12....	10.00	.....	3	172	8	23	8	.....	.....	.....
	12.00	.....	4	158	5	16	11	.....	.....	.....
	.....	4.00	5	30	7	8	4	.....	.....	.....
13....	10.00	.....	6	100	20	18	3	.....	.....	.....
	12.00	.....	7	86	12	65	3	.....	.....	.....
	.....	4.00	8	86	14	20	13	.....	.....	.....
14....	10.00	.....	9	.....	3	.....	4	.....	.....	.....
	12.00	.....	10	.....	11	.....	7	.....	.....	.....
16....	10.00	.....	11	106	4	.....	6	.....	.....	.....
	12.00	.....	12	30	8	21	7	89.0	.....	.....
				89.5	9.7	24.	11.	54.2		
								92.		
21....	12.00	.....	13	147	12	14	9	35.7	.....	.....
30....	10.00	.....	13	66	5	10	3	.....	.....	.....
	12.00	.....	14	45	.....	19	2	.....	.....	.....
	.....	4.00	15	21	3	15	.....	.....	.....	.....
31....	10.00	.....	16	65	7	10	2	.....	.....	.....
	12.00	.....	17	62	13	60	11	.....	.....	.....
	.....	4.00	18	55	20	9	.....	.....	0	0
June 1....	10.00	.....	19	80	14	6	.....	.....	.....	.....
	12.00	.....	20	58	4	4	4	.....	.....	.....
	.....	4.00	21	100	.....	8	.....	.....	0	0
2....	10.00	.....	22	45	3	4	4	85.5	.....	.....
				59.7	8.6	15.5	4	74.2		
4....	12.00	———	23	1,440	2	40	2	.....	0	—
6....	10.00	.....	24	340	3	35	4	99.7	0	+
				890	2.5	37.5	3.	92.		

RATE—15,000,000 GALLONS

May 6....	.....	4.00	270	117	50	12	8	.....	.....	.....
7....	10.00	.....	271	19	1	.....	10	.....	.....	.....
	12.00	.....	272	25	0	18	6	.....	.....	.....
9....	10.00	.....	273	230	18	30	5	.....	.....	.....
	12.00	.....	274	87	16	22	6	.....	.....	.....
	.....	4.00	275	53	8	60	11	82.5	.....	.....
				88.5	15.5	28.4	7.7	73.	.....	.....
26....	12.00	.....	278	130	7	15	3	.....	.....	.....
	.....	4.00	279	35	13	5	7	.....	0	0
27....	10.00	.....	280	25	6	10	5	.....	.....	.....
	12.00	.....	281	47	10	6	4	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
					0								0
					0								0
					0								0
					0								0
					0								0
					0								0
													0
					—								0
0		0			—								0
—		0			—								0
0		+			+								0
0		—			+								

PER ACRE PER DAY.

					0								0
					0								0
					0								0
0		0			0								0

APPENDIX A—

SAND

TANK "C"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
May 27....	.....	4.00	282	80	12	20	10	.....	.....	.....
28....	10.00	.....	283	40	2	20	9	86.	.....	.....
				59.5	8.3	12.6	6.3	50.		
June 7....	.....	4.00	284	28	3	2	6	.....	0	0
8....	10.00	.....	285	150	20	4	3	.....	.....	.....
	12.00	.....	286	180	0	10	1	.....	.....	.....
	.....	4.00	287	340	10	11	4	.....	0	0
9....	10.00	.....	288	180	0	5	0	.....	.....	.....
	12.00	.....	289	55	8	5	4	.....	.....	.....
	.....	4.00	290	45	10	8	3	.....	0	0
10....	10.00	.....	291	170	15	14	2	.....	0	0
11....	10.00	.....	292	45	3	1	3	.....	.....	.....
	12.00	.....	293	100	1	6	4	94.5	0	—
				129.3	7.0	6.6	3.0	54.5		
	.....	4.00	294	110	10	15	13		0	0
14....	10.00	.....	295	90	7	6	3	.....	0	0
	12.00	.....	296	36	4	7	1	.....	0	0
	.....	4.00	297	50	4	2	0	.....	0	0
15....	10.00	.....	298	35	7	5	2	.....	0	0
	12.00	.....	299	33	5	1	2	.....	0	0
16....	10.00	.....	300	50	3	2	2	.....	+	+
	12.00	.....	301	66	8	0	2		0	0
				58.7	6.0	4.	3.2	89.7		
	.....	4.00	302	58	6	6	3	.....	0	+
17....	10.00	.....	303	84	—	5	3	.....	0	0
	12.00	.....	304	80	—	5	—	.....	0	—
	.....	4.00	305	130	7	5	2	.....	0	0
18....	10.00	.....	306	53	7	1	1	.....	0	0
	12.00	.....	307	75	1	3	0	.....	0	0
20....	10.00	.....	308	30	3	0	0	90.7	0	0
				72.0	4.5	2.2	.75	93.7		
22....	10.00	.....	309	16	65	12	2		0	0
	12.00	.....	310	35	—	5	1		0	0
	.....	4.00	311	46	11	28	1		+	0
23....	10.00	.....	312	75	53	3	0		0	0
	12.00	.....	313	45	28	12	1		0	0
	.....	4.00	314	30	52	18	2		0	0
24....	10.00	.....	315	34	120	17	3		0	0
	12.00	.....	316	110	160	8	6		0	+
	.....	4.00	317	51	110	8	8		0	0
25....	10.00	.....	318	20	75	7	1		0	0
	12.00	.....	319	26	80	5	0		0	0
				44.3	75.	11.2	2.27	.....		
27....	.....	4.00	320	40	43	3	0	.....	0	0
28....	10.00	.....	321	52	10	6	0	.....	0	0

Results, negative infection present due to disturbance of adding strips to filters.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	—
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
0	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	0	.....	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	+	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	—	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....

APPENDIX A—

SAND

TANK "C"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
June 28....	12.00	.....	322	16	13	1	1	.....	0	+
	.....	4.00	323	14	6	10	1	.....	0	0
29....	10.00	.....	324	16	8	0	1	.....	0	0
	12.00	.....	325	21	1	0	2	.....	0	—
	.....	4.00	326	—	—	2	0	.....	0	—
				26.5	13.5	3.1	.71	77.0		
July 4....	12.00	.....	327	145	42	66	7	.....		
	.....	4.00	328	32	45	1	7	.....	—	
5....	10.00	.....	329	145	16	45	2	.....	—	
	12.00	.....	330	400	25	90	7	.....	0	
	.....	4.00	331	190	22	30	4	.....	0	
6....	10.00	.....	332	430	82	23	0	.....	0	
				223.6	38.8	49.1	4.8	82.6 90.8		
6....	.....	4.00	333	18	20	9	1	.....	—	—
7....	10.00	.....	334	175	5	33	1	.....	0	—
	12.00	.....	335	110	0	3	0	.....	—	—
	.....	4.00	336	90	1	3	0	.....	0	
8....	10.00	.....	337	42	7	6	0	.....	0	0
	12.00	.....	338	50	12	3	0	.....	0	—
	.....	4.00	339	44	8	21	3	.....	0	0
9....	10.00	.....	340	28	8	1	0	.....	0	0
	12.00	.....	341	325	3	165	5	92.7		
				98	7.1	27.1	1.1	96.0		
12....	12.00	.....	342	94	3	12	1	.....	—	—
	.....	4.00	343	31	1	6	3	.....	0	
13....	10.00	.....	344	28	2	3	1	.....	—	—
	12.00	.....	345	21	4	8	1	.....	0	—
13....	.....	4.00	346	65	4	6	0	.....	0	0
14....	12.00	.....	347	60	4	10	0	18°	0	+
	.....	4.00	348	68	5	20	1	94.0	0	0
				52.4	3.2	9.2	1.0	89.2		
15....	12.00	.....	349	96	10	3	4	.....	0	0
	.....	4.00	350	17	8	6	1	.....	—	—
16....	10.00	.....	351	140	3	35	0	.....	+	+
	12.00	.....	352	280	2	51	0	95.5	+	+
				133.2	5.7	23.7	1.2	95.4		
18....	.....	4.00	353	36	10	1	4	.....	0	+
19....	10.00	.....	354	67	3	6	3	.....	0	+
	12.00	.....	355	—	—	13	1	.....	0	0
	.....	4.00	356	100	1	12	2	.....	0	0
20....	10.00	.....	357	170	2	3	0	.....	+	—
	12.00	.....	358	126	1	80	0	.....	+	+
	.....	4.00	359	84	1	19	1	.....	0	+
21....	10.00	.....	360	115	7	45	1	.....	—	

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	–	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	.....
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	0	.....	.....	+	.....	.....	.....	.....	.....	0	.....	.....
+	.....	.....	-	.....	+	.....	.....	.....	.....	.....	+	.....	.....
—	.....	.....	-	.....	+	.....	.....	.....	.....	.....	.....	.....	0
–	.....	.....	-	.....	+	.....	.....	.....	.....	.....	.....	.....	—
—	.....	.....	-	.....	+	.....	.....	.....	.....	.....	.....	.....	0
-	.....	.....	-	.....	+	.....	.....	.....	.....	.....	.....	.....	0
-	.....	.....	-	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	0	.....	.....	.....	.....	.....	0
+	.....	.....	–	.....	+	.....	0	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	0	.....	0	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	0	.....	0	.....	.....	.....	—
+	.....	.....	+	.....	+	.....	0	.....	.....	0	.....	.....	0
0	.....	.....	+	.....	+	.....	0	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	—	.....	.....	.....	.....	.....	.....	.....	+
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	*
0	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	*
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	—
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	—	.....	—	.....	.....	.....	.....	.....	.....	.....	0
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	-
+	.....	.....	.	.....	—	.....	.....	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	0

APPENDIX A—

SAND

TANK "C"—RATE 15,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
July 21....	12.00	.....	361	120	2	21	2	.....	—	0
.....	.....	4.00	362	120	4	64	2	.....	0	0
22....	10.00	.....	363	100	6	9	0	.....	0	0
				183.6	3.7	24.8	1.4	94.3		
22....	.....	4.00	36-	70	—	10	—	.....	+	+
23....	10.00	.....	364	70	5	3	9	.....	0	0
	12.00	.....	365	70	2	2	1	95.1	+	+
				70.	3.5	5.0	5.0	0.		
26....	12.00	.....	366	500	4	15	2	.....	.....	.....
.....	.....	4.00	367	62	54	10	1	.....	0	+
27....	10.00	.....	368	95	45	12	9	.....	.....	.....
	12.00	.....	369	18	5	4	1	.....	.....	.....
	.....	4.00	370	145	3	—	4	.....	0	0
28....	10.00	.....	371	10	0	6	3	.....	0	+
	12.00	.....	372	145	0	11	7	.....	.....	.....
	.....	4.00	373	175	1	91	7	90.2	+	+
				143.7	14	21.3	4.2	80.2		
30....	10.00	.....	374	350	7	3	13	98.0	0	0
Aug. 4....	10.00	.....	375	7	4	2	0	.....	.....	0
	12.00	.....	376	39	0	27	1	.....	.....	0
5....	10.00	.....	377	181	1	4	2	.....	0	0
	12.00	.....	378	91	2	0	0	.....	.....	0
6....	10.00	.....	379	24	0	1	0	.....	.....	.....
	12.00	.....	380	40	0	—	4	.....	.....	.....
8....	10.00	.....	381	80	1	0	0	98.2	.....	.....
				66.	1.1	5.66	1.0	82.3		
10....	10.00	.....	382	13	1	1	1	.....	0	0
	12.00	.....	383	23	1	0	1	.....	0	0
11....	10.00	.....	384	58	1	47	0	.....	0	0
	12.00	.....	385	58	1	17	0	.....	8	—
12....	10.00	.....	386	49	2	65	1	.....	—	0
	12.00	.....	387	52	4	20	—	.....	0	0
13....	10.00	.....	388	121	3	4	3	.....	0	0
	12.00	.....	389	93	3	1	2	.....	0	0
15....	10.00	.....	390	13	3	2	0	96.0	0	0
				53.3	2.1	17.4	1	94.2		
16....	12.00	.....	391	17	9	0	—	.....	0	0
17....	12.00	.....	392	51	7	1	1	76.5	0	0
				34.0	8.0	.....	.....	.....		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0			+		+								0
+			+		+								0
0			0		+								0
+			+		+								
0			0		0								0
+			+		+								0
—			—		—								0
0													
—													
—			—										0
+													
+													0
—			0										
0			0								0		
—			0								0		
0			0								0		
—			+								0		
0		0	0					0			0		
0		0	0					0			0		
0		0	0					0			0		
0			0		0						0		0
0			+		0						0		0
0			0		+						+		0
+			—		+						0		+
0			—		+						0		0
0			0		+						0		0
0			+		+						0		0
0			0		+						0		0
0			+		+	0	0	0			0		0
+			0			0	0	0			0		
0			0		—						0		0

APPENDIX A—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Aug. 30....	10.00	.....	393	233	114	12	85	.....	0	—
	12.00	.....	394	900	70	90	51	.....	—	—
31....	10.00	.....	395	140	22	8	23	.....	0	0
	12.00	.....	396	130	27	31	24	.....	+	+
	.....	4.00	397	60	13	4	17	.....	0	—
Sept. 1....	10.00	.....	398	280	9	34	6	.....	—	+
	12.00	.....	399	140	8	21	10	.....	+	+
2....	10.00	.....	400	1,440	17	7	4	.....	0	+
	12.00	.....	401	185	15	24	10	.....	+	+
	.....	4.00	402	164	12	36	13	.....	+	+
3....	10.00	.....	403	24	15	4	24	.....	0	+
	12.00	.....	404	18	9	6	8	.....	+	+
3....	10.00	.....	405	290	12	63	4	.....	.....	+
	12.00	.....	406	18	2	2	2	.....	.....	0
	.....	4.00	407	36	2	3	0	.....	—	+
7....	10.00	.....	408	130	4	11	4	.....	+	+
	12.00	.....	409	343	4	57	4	.....	.....	.....
	.....	4.00	410	150	6	3	2	.....	.....	.....
8....	10.00	.....	411	108	5	24	0	.....	+	+
	12.00	.....	stop'd	252	19.2	23.1	15.3			
8....	.....	4.00	412	—	6	4	5	.....	.....	+
9....	10.00	.....	413	310	13	47	10	.....	—	+
	12.00	.....	414	224	7	32	4	.....	+	+
	.....	4.00	415	116	9	45	8	.....	+	+
10....	10.00	.....	416	265	1	17	4	.....	+	+
	12.00	.....	417	77	3	25	8	.....	+	+
12....	10.00	.....	418	520	6	10	2	.....	+	+
	12.00	.....	419	600	7	240	4	.....	.....	.....
13....	10.00	.....	420	580	3	7	2	.....	.....	.....
14....	10.00	.....	421	2,000	9	80	8	.....	+	+
	12.00	.....	422	1,200	170	54	170	.....	+	+
	.....	4.00	423	900	11	25	8	.....	+	+
15....	10.00	.....	424	12	2	1	2	.....	+	+
	12.00	.....	425	16	0	3	2	.....	+	+
	.....	4.00	426	28	8	12	2	.....	+	+
16....	10.00	.....	427	32	3	7	5	.....	0	+
	12.00	.....	428	9	3	—	—	.....	0	+
	.....	4.00	429	16	2	4	7	.....	—	+
17....	10.00	.....	430	12	3	—	—	.....	—	+
19....	10.00	.....	431	73	0	15	2	.....	—	+
	12.00	.....	432	23	3	11	2	.....	+	—
	.....	4.00	433	103	4	4	1	.....	+	+
20....	10.00	.....	434	35	2	3	0	.....	0	0
22....	.....	5.00	435	142	7	9	5	.....	0	+
23....	10.00	.....	436	96	4	1	4	.....	+	+
	12.00	.....	437	320	4	2	2	.....	0	0
24....	12.00	.....	438	43	1	—	5	.....	—	+
	.....	.....	stop'd	298.0	11.1	27.8	10.8			
27....	.....	4.00	439	—	—	3	4	.....	0	—
28....	12.00	.....	440	536	7	44	2	.....	—	+

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	—
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	—	.....	—
0	.....	.....	—	.....	+	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
0	.....	.....	+	.....	—	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	—	.....	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	+	—	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	—	+	.....	.....	+	.....	+
—	.....	.....	+	.....	+	.....	+	+	.....	.....	-	.....	+
+	.....	.....	+	.....	+	.....	+	+	.....	.....	+	.....	+
.....	.....	.....	—	.....	+	.....	+	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	0	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	+	.....	+	0	—	0	.....	.....	—	.....	+
+	.....	.....	+	.....	+	0	0	+	.....	.....	—	.....	—
+	.....	.....	+	.....	+	0	+	+	.....	.....	-	.....	+
+	.....	.....	+	.....	.....	.....	0	+	.....	.....	+	.....	.....
+	.....	+	.....	.....	.....	0	—	.....	.....	.....	.....	.....	.....
.....	.....	.....	+	.....	+	.....	0	.....	.....	.....	+	.....	.....
.....	.....	.....	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	+
.....	+	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	+	.....	+	.....	+	.....	—	+	.....	.....	—	.....	+
.....	+	.....	+	.....	+	.....	—	+	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	+	.....	.....
.....	+	.....	+	.....	+	.....	0	+	.....	.....	—	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	—	.....	.....
.....	+	.....	+	.....	+	.....	—	—	.....	.....	+	.....	.....
+	.....	.....	+	.....	.....	.....	0	0	.....	.....	+	.....	.....
+	.....	.....	+	.....	+	.....	0	+	.....	.....	+	.....	.....
+	.....	.....	+	.....	+	.....	+	0	.....	.....	0	.....	.....
—	.....	.....	+	.....	.....	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	.....	.....	0	0	.....	.....	—	.....	.....
.....	+	.....	+	.....	.....	.....	0	.....	0	.....	-	.....	.....
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+
.....	0	.....	0	.....	*0	.....	*0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	+	.....	0	.....	+
.....	+	.....	+	.....	+	.....	!	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	-	.....	+
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+

* Incubate 57°C.

APPENDIX A—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Sept. 29....	.....	5.00	441	590	4	—	3	.....	0	—
30....	.....	5.00	442	710	0	69	4	.....	0	0
Oct. 1....	12.00	.....	443	51	1	45	7	.....	0	0
3....	.....	5.00	444	247	1	5	3	.....	0	0
4....	.....	4.00	445	30	3	55	1	.....	.....	0
5....	12.00	.....	446	21	5	35	3	.....	.....	0
6....	12.00	.....	447	34	0	6	3	.....	.....	+
7....	12.00	.....	448	141	14	13	0	.....	.....	+
8....	12.00	.....	449	145	14	1	13	.....	.....	0
10....	12.00	.....	450	153	3	2	—	.....	.....	0
11....	.....	4.00	451	200	2	2	1	.....	.....	.....
12....	12.00	.....	452	71	10	0	2	.....	0	0
				225.3	5.0	21.5	3.5			

RATE 10,000,000 GALLONS

Oct. 13....	12.00	.....	453	28	7	2	13	.....	0	0
14....	12.00	.....	454	156	225	2	2	.....	0	0
15....	12.00	.....	455	71	120	6	4	.....	0	0
17....	.....	5.00	456	388	67	3	1	.....	0	+
18....	.....	5.00	457	180	150	9	101	.....	0	+
19....	.....	5.00	458	800	150	900	180	.....	0	0
20....	10.00	.....	459	640	120	50	50	.....	0	+
21....	.....	4.00	460	1,200	38	359	43	.....	—	—
	.....	.....	stop'd	433.0	109.6	166.5	49.2			
24....	.....	4.00	461	240	39	6	0	.....	0	+
25....	10.00	.....	462	130	6	3	3	.....	0	—
26....	10.00	.....	463	196	3	5	2	.....	0	—
27....	12.00	.....	464	—	—	8	1	.....	0	0
28....	.....	5,00	465	37	41	9	31	.....	0	0
Nov. 1....	10.00	.....	466	75	70	4	4	.....	0	0
2....	.....	3.30	467	4	2	3	11	.....	0	0
4....	.....	3.00	468	150	120	7	35	.....	0	0
5....	10.30	.....	469	52	360	6	96	.....	0	0
	.....	.....	stop'd	110.5	80.1	5.6	20.3			
8....	11.30	.....	470	2	1,500	0	1	.....	0	0
9....	10.00	.....	471	1	1,000	3	2	.....	0	0
10....	10.00	.....	472	186	400	9	2	.....	0	0
11....	.....	5,00	473	2	150	2	0	.....	0	0
12....	12.00	.....	474	12	75	3	2	.....	0	0
13....	10.00	.....	.....	.....	Rate changed without cleaning to 3,0 00,000					
14....	10.00	.....	475	2	46	5	0	.....	0	0
15....	11.00	.....	476	0	14	2	0	.....	0	0
16....	12.00	.....	477	0	10	1	2	.....	0	0
17....	.....	5.00	478	0	800	0	1	.....	0	0
18....	11.30	.....	479	3	400	1	3	.....	0	0
19....	10.30	.....	480	0	157	1	1	.....	0	0
21....	.....	5.00	481	5	80	1	0	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	0	.....	+	.....	+	.....	0	.....	0	.....	+	.....	0
.....	—	.....	—	.....	+	.....	.....	.....	—	.....	—	.....	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	+	.....	0
.....	0	.....	—	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	+	.....	.....	.....	0	.....	+	.....	—
.....	0	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	+	.....	+	.....	.....	.....	—	.....	+	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—

PER ACRE PER DAY.

.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—
.....	+	.....	+	.....	+	.....	0	.....	.....	.....	0	.....	
.....	.....	.....	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	—	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+
.....	+	.....	+	.....	+	—	—	.....	0	.....	—	.....	+
.....	—	.....	+	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	—	.....	0	0	—	.....	0	.....	0	.....	0
.....	—	.....	0	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	—	.....	—	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	+	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
.....	0	.....	—	.....	+	0	0	.....	—	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	—	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	+	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
Gals.	per ac	re per	day.										
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	—	.....	—	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0

APPENDIX A—

SAND

TANK "C"—RATE 3,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour.		Serial No.	Bacterial Counts.				Bact. Eff'cy.	Influent.	
	A.M.	P.M.		18°–22°C.		37.5°C.				
				Inf.	Eff.	Inf.	Eff.		1 C.C.	5 C.C.
1910										
Nov 22....	10.00	.....	482	8	20	8	0	.....	0	0
23....	.....	4.00	483	6	11	29	3	.....	0	0
24....	.....	5.00	484	1	7	1	0	.....	0	0
25....	10.30	.....	485	9	22	0	1	.....	0	0
26....	.....	1.00	486	5	26	4	2	.....	0	0
28....	10.00	.....	487	—	—	1	1	.....	0	0
29....	10.00	.....	488	—	—	11	2	.....	0	0
Dec. 1....	.....	5.00	489	2	3	2	1	.....	0	0
2....	.....	4.00	490	14	26	9	3	.....	0	0
3....	12.30	.....	491	16	7	10	3	.....	0	0
5....	9.30	.....	stop	13.7	237.7	4.5	1.3			
	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
6....	10.00	.....	492	7	3	2	0	.....	0	0
7....	.....	4.00	493	56	5	4	0	.....	0	0
8....	.....	3.30	494	11	2	3	1	.....	0	0
9....	.....	4.30	495	15	7	4	0	.....	0	0
10....	10.30	.....	496	100	2	—	—	.....	.....	.....
14....	.....	3.00	497	32	6	2	0	.....	0	0
15....	.....	5.30	498	22	4	5	2	.....	0	0
16....	.....	5.00	499	13	7	1	0	.....	0	0
19....	.....	3.00	500	45	4	2	0	.....	0	+
22....	.....	4.00	501	53	0	0	1	.....	0	0
27....	.....	4.00	502	50	12	—	3	.....	0	0
30....	.....	4.00	503	458	11	6	0	.....	0	0
Jan. 3....	.....	5.00	504	0	0	2	0	.....	+	0
				66.3	4.8	2.8	.6	.....		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	—	.....	—	.....	+	.....	.....	.....	—	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	—	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	.....	—	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	+	.....	0	.....	.....	.....	0	.....	+	.....	+
.....	0	.....	+	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—

APPENDIX A—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read. 6	Max. Loss of Head.	Bacterial Counts. 18°-22°C Inf.	Bacterial Counts. 18°-22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Sept. 15....	10.20	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	10.30	.....	1	.....	.....	90	77	.....	.....	.....
	12.00	.....	2	.....	.....	120	200	.....	.....	.....
	.....	4.00	3	.....	.....	310	109	.....	.....	.....
16....	9.30	.....	4	0.61	0.61	230	30	.....	.....	.....
	12.00	.....	5	.....	.....	170	160	.....	.....	.....
	.....	4.00	6	.....	.....	70	59	.....	.....	.....
17....	9.30	.....	7	0.8	0.8	520	240	.....	.....	.....
	12.00	.....	8	.....	.....	180	70	.....	.....	.....
	.....	4.00	9	.....	.....	70	40	.....	.....	.....
18....	9.30	.....	10	0.9	0.9	330	147	.....	.....	.....
	12.00	.....	11	.....	.....	—	—	.....	.....	.....
20....	12.00	.....	12	1.5	1.5	260	43	.....	.....	.....
	.....	4.15	13	.....	.....	150	25	.....	.....	.....
21....	9.30	.....	14	2.0	2.0	160	34	.....	.....	.....
	12.00	.....	15	.....	.....	80	22	.....	.....	.....
	.....	4.00	16	.....	.....	148	13	.....	.....	.....
22....	9.30	.....	17	2.3	2.3	560	18	.....	.....	.....
	12.00	.....	18	.....	.....	250	12	.....	.....	.....
	.....	4.00	19	.....	.....	680	10	.....	.....	.....
23....	9.30	.....	20	2.95	2.95	350	20	.....	.....	.....
	12.00	.....	21	.....	.....	160	6	.....	.....	.....
	.....	12.40	stop	3.3	3.3	244.4	66.7	72.6		
	.....	5.00	start	0.0	0.0	.....	.....	.....	.....	.....
24....	9.45	.....	23	0.7	0.7	540	7	.....	.....	.....
	12.00	.....	24	.....	.....	250	9	.....	.....	.....
	.....	4.00	25	.....	.....	430	—	.....	.....	.....
25....	9.30	.....	26	0.65	0.65	390	2	.....	.....	.....
	12.00	.....	27	.....	.....	24000	1	.....	.....	.....
25....	.....	4.00	28	.....	.....	299	8	.....	.....	.....
27....	9.30	.....	29	.....	.....	330	1	.....	.....	.....
	12.00	.....	30	1.0	1.0	610	2	.....	.....	.....
	.....	4.00	31	1.0	1.0	490	2	.....	.....	.....
28....	9.30	.....	32	1.4	1.25	1,180	2	.....	.....	.....
	12.00	.....	33	.....	.....	920	3	.....	.....	.....
	.....	4.00	34	1.8	1.8	730	0	.....	.....	.....
20....	9.30	.....	35	.....	.....	1,200	14	.....	.....	.....
	.....	4.00	36	.....	.....	110	1	.....	.....	.....
30....	9.30	.....	37	2125	2.29	310	3	.....	.....	.....
	12.00	.....	38	.....	.....	1,300	6	.....	.....	.....
	.....	4.00	43	.....	.....	214	1	.....	.....	.....
Oct. 1....	9.30	.....	44	.....	.....	280	3	.....	.....	.....
	12.00	.....	48	.....	.....	257	0	.....	.....	.....
	.....	3.00	stop	3.15	3.15	1,781	3.4	99.7		
2....	10.45	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	51	1.0	1.0	76	28	.....	.....	.....
4....	12.00	.....	52	.....	.....	140	7	.....	.....	.....
	.....	4.00	53	0.9	0.9	157	2	.....	.....	.....
5....	9.30	.....	54	0.9	0.9	200	4	.....	.....	.....
	12.00	.....	55	0.9	0.9	112	1	.....	.....	.....
	.....	4.00	56	1.0	1.0	173	2	.....	.....	.....
6....	9.30	.....	57	1.0	1.0	440	2	.....	.....	.....
	12.00	.....	58	1.1	1.1	230	2	.....	—	—

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX A—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1909	Hour. A.M.	Hour. P.M.	Serial No.	Gauge read. 6	Max. loss of head.	Bacterial counts. 18°-22°C Inf.	Bacterial counts. 18°-22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Oct. 6....	.....	4.00	59	1.05	1.05	260	4	.....	+	+
7....	9.30	.....	60	1.25	1.25	270	2	.....	+	+
	12.00	.....	61	.....	.....	220	1	.....	+	+
	.....	4.00	62	1.3	1.3	220	1	.....	—	+
8....	9.30	.....	63	1.5	1.5	940	4	.....	.....	.....
	12.00	.....	64	1.5	1.5	290	14	.....	—	+
	.....	4.00	65	1.55	1.55	940	16	.....	+	+
9....	9.30	.....	66	1.8	1.8	200	2	.....	.....	.....
	12.00	.....	67	1.8	1.8	400	1	.....	+	+
11....	9.30	.....	68	2.4	2.4	560	30	.....	—	—
	12.00	.....	69	2.45	2.45	150	1	.....	—	+
	.....	4.00	70	2.6	2.6	89	0	.....	—	+
12....	9.30	.....	71	2.9	2.9	144	1	.....	—	+
	12.00	.....	72	2.95	2.95	151	0	.....	—	+
	.....	4.00	73	2.9	2.9	157	0	.....	+	+
13....	9.30	.....	74	3.2	3.2	151	2	.....	—	+
	11.30	.....	stop	3.3	3.3	278.3	5.3	98.0		
14....	11.30	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	.....	4.00	79	1.0	1.0	150	0	.....	—	+
15....	9.30	.....	80	0.8	0.8	151	8	.....	.....	.....
	12.00	.....	81	0.8	0.8	1,520	89	.....	.....	.....
	.....	4.00	82	0.8	0.8	240	3	.....	.....	.....
16....	9.30	.....	83	0.8	0.8	70	1	.....	.....	.....
	12.00	.....	84	0.8	0.8	202	320	.....	.....	.....
18....	12.00	.....	85	0.8	0.8	220	2	.....	.....	.....
	.....	3.30	86	0.8	0.8	129	1	.....	.....	.....
19....	9.30	.....	87	1.0	1.0	160	4	.....	.....	.....
	12.00	.....	88	.....	.....	330	2	.....	.....	.....
	.....	4.00	89	1.0	1.0	460	1	.....	.....	.....
20....	9.30	.....	90	1.1	1.1	170	0	.....	.....	.....
	12.00	.....	91	1.15	1.15	1,200	1	.....	.....	.....
	.....	4.00	92	1.5	1.5	3,460	9	.....	.....	.....
21....	9.30	.....	93	1.8	1.8	2,580	3	.....	.....	.....
	12.00	.....	94	1.8	1.8	920	30	.....	.....	.....
	.....	4.00	95	1.9	1.9	1440	14	.....	.....	.....
22....	9.00	.....	stop	3.3	3.3	788.3	28.1	96.4		
26....	.....	4.45	start	0.0	0.0	.....	.....	.....	.....	.....
27....	9.30	.....	97	0.9	0.9	91	3	.....	—	+
	12.00	.....	98	0.9	0.9	60	5	.....	—	+
	.....	4.00	99	0.9	0.9	40	1	.....	+	—
28....	12.00	.....	100	0.9	0.9	35	0	.....	—	+
	.....	3.00	101	0.8	0.8	60	0	.....	—	—
29....	.....	3.00	102	0.8	0.8	60	4	.....	—	+
30....	9.30	.....	103	0.9	0.9	55	0	.....	+	+
	12.00	.....	104	0.9	0.9	80	0	.....	.....	.....
Nov. 1....	9.30	.....	105	1.3	1.3	130	1	.....	.....	.....
	12.00	.....	106	1.6	1.6	60	2	.....	.....	.....
	.....	3.00	107	1.6	1.6	30	0	.....	.....	.....
3....	.....	4.00	108	2.55	2.55	41	0	.....	.....	.....
5....	9.30	.....	109	3.0	2.0	70	0	.....	.....	.....
	12.00	.....	110	3.1	3.1	60	10	.....	.....	.....
	.....	3.00	111	2.15	3.15	35	0	.....	.....	.....
		5.00	stop	3.3	3.3	60.4	1.7	97.1		

Continued,

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	+	+	+	+	+	—	—	—	+	+	+	—	—
+	+	+	+	+	+	—	+	—	—	—	+	+	+
+	+	+	+	+	+	—	+	—	—	—	+	—	+
+	+	+	+	+	+	—	—	+	—	—	+	+	+
+	+	+	+	+	+	—	—	—	+	+	+	+	+
+	+	+	+	+	+	—	—	—	—	—	+	+	+
+	+	+	+	+	+	—	—	—	+	—	—	+	+
+	+	+	+	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	—	—	—	—	—	—	+
+	+	+	+	+	+	—	—	—	—	—	+	—	—
+	+	+	+	+	+	—	—	—	—	+	—	+	—
+	+	+	+	+	+	—	—	—	—	+	+	+	+
+	+	+	+	+	+	—	+	—	+	—	—	+	+
+	+	+	+	+	+	—	—	—	—	+	+	+	—
+	+					—	+	—		+	+	+	+
+	+	+	+	+	+	+	—	+	+	—	+	+	+
+	+	+	+	+	+	—	—	+	—	+	+	+	+
+	+	+	+	+	+	—	—	+	+	—	—	+	—
+	+	+	+	+	+	—	+	—	+	—	—	+	+
+	+	+	+	+	+	—	+	+	+	+	+	+	+
—	+	+	+	+	+	—	—	—	—	+	—	—	+

APPENDIX A—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Gauge Read 6	Max. Loss of Head	Bacterial Counts. 18°-22°C Inf.	Bacterial Counts. 18°-22°C Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1909										
Nov. 6....	.....	1.00	start	0.0	0.0	.....	.....	.....	.....	.....
8....	12.00	.....	114	0.7	0.7	55	0	.....	.....	.....
	.....	4.00	115	0.7	0.7	85	0	.....	.....	.....
9....	10.00	.....	116	0.7	0.7	100	1	.....	.....	.....
	12.00	.....	117	0.7	0.7	75	1	.....	.....	.....
	.....	4.00	118	0.7	0.7	65	1	.....	.....	.....
10....	9.30	.....	119	1.3	1.3	65	1	.....	—	—
	12.00	.....	120	1.4	1.4	120	0	.....	+	+
	.....	3.00	121	1.6	1.6	65	0	.....	—	—
11....	9.30	.....	122	2.4	2.4	80	0	.....	—	—
	12.00	.....	123	2.65	2.65	50	0	.....	—	—
	.....	3.30	124	2.8	2.8	35	0	.....	—	—
12....	9.30	.....	125	3.5	3.5	40	0	.....	+	—
	9.30	.....	stop	.....	.....	69.5	0.3	99.6		
13....	10.00	.....	start	0.0	0.0	.....	.....	.....	.....	.....
	12.00	.....	128	0.9	0.9	90	960	.....	—	—
15....	9.30	.....	129	0.8	0.8	21	0	.....	—	—
	12.00	.....	130	0.8	0.8	75	35	.....	—	—
	.....	4.00	131	0.9	0.9	—	—	.....	—	—
16....	9.30	.....	132	0.9	0.9	400	12	.....	—	—
	.....	4.00	133	0.8	0.8	100	19	.....	—	—
17....	12.00	.....	134	2.2	2.2	430	41	.....	—	—
	.....	4.00	125	1.45	1.45	800	10	.....	+	+
18....	9.30	.....	136	1.8	1.8	250	—	.....	—	+
	12.00	.....	137	1.8	1.8	90	5	.....	—	+
	.....	4.00	138	1.85	1.85	125	—	.....	+	+
19....	9.30	.....	139	2.1	2.1	280	—	.....	.....	.....
	12.00	.....	140	2.1	2.1	165	—	.....	.....	.....
22....	.....	3.30	141	3.35	3.35	6400	0	.....	+	+
	.....	3.30	stop			934	120.2	87.2		
29....	.....	1.00	start	.....	.....	.....	.....	.....	.....	.....
29....	.....	4.00	149	.....	.....	300	23	.....	.....	.....
30....	9.30	.....	150	.....	.....	330	11	.....	.....	.....
Dec. 1....	9.30	.....	151	.....	.....	90	0	.....	.....	.....
	12.00	.....	152	.....	.....	140	12	.....	.....	.....
	.....	4.00	153	.....	.....	110	34	.....	.....	.....
2....	9.30	.....	154	.....	.....	160	22	.....	.....	.....
3....	9.30	.....	155	.....	.....	450	18	.....	.....	.....
4....	9.30	.....	156	.....	.....	85	4	.....	.....	.....
	9.30	.....	stop	.....	.....	208.1	17.9	91.4		
6....	.....	4.30	start	.....	.....	.....	.....	.....	.....	.....
	.....	4.30	158	.....	.....	—	—	—	.....	.....
9....	9.30	.....	159	.....	.....	—	—	—	.....	.....
	9.30	.....	stop	.....	.....	.....	.....	.....	.....	.....

New Sand placed on filters in Feb. 20 cu. yds. received Jan. 28th, 1910.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	+	+	+	—	+	—	—	—	—	—	—	—	—
+	+	+	—	+	+	—	—	—	—	+	—	—	—
—	—	—	+	+	+	—	+	—	+	+	+	+	+
+	+	+	—	—	—	—	—	+	+	+	—	—	+
+	+	+	+	+	+	—	+	—	—	+	—	—	+
+	+	—	+	+	+	—	—	—	—	—	—	—	+
+	+	+	+	+	+	—	—	—	—	—	—	+	+
+	+	+	+	—	—	—	—	+	+	+	+	+	+
—	+	+	—	—	—	—	—	—	+	+	—	—	—
+	—	—	—	—	+	—	—	—	—	+	—	—	—
+	+	+	+	+	+	—	—	—	—	—	—	—	—
—	+	+	+	+	+	—	—	—	—	—	—	—	—
—	+	+	—	+	+	—	—	—	—	—	—	—	—
+	+	+	+	+	+	—	—	+	—	—	—	—	—
+	+	+	+	+	+	—	—	+	—	—	—	—	—
+	+	+	+	+	+	—	—	—	—	+	—	—	+
+	+	+	+	+	+	—	—	+	+	—	—	—	—
+	+	+	+	+	+	—	—	—	—	—	—	+	—

APPENDIX A—

SAND

TANK "D"—RATE 20,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Feb. 16....	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
17....	9.30	.....	stop	.....	.....	.....	.....	.....	.....	.....
	.....	5.00	start	.....	.....	.....	.....	.....	.....	.....
18....	.....	5.00	stop	.....	.....	.....	.....	.....	.....	.....
April 4....	12.00	.....	start	.....	.....	.....	.....	.....	.....	.....
	.....	4.00	246	142	115	.....	.....	.....	0	0
5....	10.00	.....	247	96	100	.....	.....	.....	0	0
	12.00	.....	248	180	71	.....	.....	.....	0	0
	.....	4.00	249	47	47	.....	.....	.....	0	0
6....	9.30	.....	stop	166.	83.	.....	.....	50.		
8....	10.00	.....	start	.....	.....	.....	.....	.....	.....	.....
	12.00	.....	257	28	22	.....	.....	.....	0	0
	.....	4.00	258	38	17	.....	.....	.....	0	0
9....	10.00	.....	259	3	0	.....	.....	.....	0	+
	12.00	.....	260	0	0	.....	.....	.....	0	0
	.....	1.00	stop	17.25	9.75	.....	.....	43.4		

RATE 12,000,000 GALLONS

May 5....	.....	4.00	269	108	8	6	2	.....	.....	.....
6....	10.00	.....	270	162	8	29	10	.....	.....	.....
	12.00	.....	271	222	69	48	9	.....	.....	.....
	.....	4.00	272	117	51	12	4	.....	.....	.....
7....	10.00	.....	273	19	4	.....	6	.....	.....	.....
	12.00	.....	274	25	7	18	11	77.5	.....	.....
				109.	24.5	22.6	7.0	69.0		
10....	.....	4.00	275	108	7	31	21	.....	.....	.....
11....	10.00	.....	276	17	1	14	6..	.....	.....	.....
	12.00	.....	277	.....	14	22	.....	.....	.....	.....
	.....	4.00	278	38	18	.....	8	.....	.....	.....
12....	10.00	.....	279	172	14	23	9	.....	.....	.....
	12.00	.....	280	158	7	16	10	.....	.....	.....
	.....	4.00	281	30	8	8	1	.....	.....	.....
13....	10.00	.....	282	100	14	18	4	.....	.....	.....
	12.00	.....	283	86	40	65	8	.....	.....	.....
	.....	4.00	284	86	29	20	8	.....	.....	.....
14....	10.00	.....	285	.....	3	.....	8	.....	.....	.....
	12.00	.....	286	.....	10	.....	8	84.4	.....	.....
				88.3	13.75	24.1	8.27	65.7		
				.....	.....	.....	.....	77.5	.....	.....
21....	12.00	.....	287	14.7	33	14	4	71.5		
26....	12.00	.....	288	130	4	15	5	.....	.....	.....
	.....	4.00	289	35	5	5	8	.....	0	0
27....	10.00	.....	290	25	2	10	4	.....	.....	.....
	12.00	.....	291	47	3	6	4	.....	.....	.....
	.....	4.00	292	80	8	20	2	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
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+	+	+	.....	+	.....	.....	.....	0	0	0	.....	0	.....
0	0	0	.....	0	.....	.....	.....	0	0	0	.....	0	.....

PER ACRE PER DAY.

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APPENDIX A—

SAND

TANK "D"—RATE 12,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
May 28....	10.00	.....	293	40	3	20	.....	.....	.....	.....
	12.00	.....	294	48	4	20	3	.....	.....	.....
30....	10.00	.....	295	66	3	10	2	93.8	.....	.....
				58.9	388	13.25	4.	69.8		
June 1....	12.00	.....	296	58	13	4	7	.....	.....	.....
	.....	4.00	297	100	3	8	3	.....	0	0
2....	10.00	.....	298	45	4	4	2	.....	.....	.....
								90.3		
				67.6	6.6	5.3	4	24.6		
3....	.....	4.00	299	26	4	5	2	.....	0	0
4....	10.00	.....	300	40	3	15	5	.....	.....	.....
	12.00	.....	301	1,440	0	40	3	99.6	0	—
				502.	2.3	20.	3.3	83.5		
6....	.....	4.00	302	45	16	30	—	.....	0	0
7....	10.00	.....	303	100	10	8	1	.....	.....	.....
	12.00	.....	304	140	1	9	2	.....	.....	.....
	.....	4.00	305	128	4	2	3	.....	0	0
8....	10.00	.....	306	150	15	4	2	.....	.....	.....
	12.00	.....	307	180	5	10	0	.....	.....	.....
	.....	4.00	308	340	10	11	1	.....	0	0
								94.2		
				155.	8.7	10.6	1.5	85.8		
13....	12.00	.....	309	95	27	8	13	.....	0	0
	.....	4.00	310	110	14	15	1	.....	0	0
14....	10.00	.....	311	90	13	6	1	.....	0	0
	12.00	.....	312	36	11	7	2	.....	0	0
	.....	4.00	313	50	6	2	2	.....	0	0
15....	10.00	.....	314	35	3	5	1	.....	0	0
	12.00	.....	—	33	—	1	—	.....	0	0
16....	10.00	.....	315	50	8	2	0	.....	+	+
	12.00	.....	316	66	2	0	1	.....	0	0
	.....	4.00	317	58	9	6	3	.....	0	+
17....	10.00	.....	318	84	40	5	5	.....	0	0
	12.00	.....	219	80	—	5	—	.....	0	—
	.....	4.00	320	130	45	5	4	.....	0	0
18....	10.00	.....	321	53	13	1	2	.....	0	0
	12.00	.....	322	75	15	3	1	.....	0	0
20....	10.00	.....	323	30	15	0	2	.....	0	0
								76.5		
				67.2	15.8	4.4	2.7	38.6		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
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0		0			0								0

APPENDIX A—

SAND

TANK "D"—RATE 12,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1910	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
June 21....	.....	4.00	324	110	20	5	2		0	0
22....	10.00	.....	325	16	24	12	4		0	0
	12.00	.....	326	35	9	5	3		0	0
	.....	4.00	327	46	6	28	1		+	0
23....	10.00	.....	328	75	85	3	1		0	0
	12.00	.....	329	45	40	12	4		0	0
	.....	4.00	330	30	66	18	3		0	0
24....	10.00	.....	331	34	160	17	3		0	0
	12.00	.....	332	110	100	8	6		0	+
	.....	4.00	333	51	18	8	7		0	0
25....	10.00	.....	334	20	36	7	4		0	0
	12.00	.....	335	26	60	5	13		0	0
				49.9	52.0	10.7	42.5			
27....	.....	4.00	336	40	18	3	5	.....	0	0
28....	10.00	.....	337	52	9	6	1	.....	0	0
	12.00	.....	338	16	2	1	0	.....	0	+
	.....	4.00	339	14	3	10	0	.....	0	0
29....	10.00	.....	340	16	4	0	1	.....	0	0
	12.00	.....	341	21	2	0	0	.....	0	—
	.....	4.00	342	—	—	2	0	.....	0	—
July 4....	12.00	.....	343	145	33	66	5	.....	+	+
	.....	4.00	344	32	54	1	7	.....	—	+
5....	10.00	.....	345	145	19	45	3	.....	—	+
	12.00	.....	346	400	35	90	5	.....	0	+
	.....	4.00	347	190	14	30	5	.....	.....	.....
6....	10.00	.....	348	430	26	23	3	.....	0	+
				117.0	18.25	21.3	2.7	85.2 87.5		
6....	.....	4.00	349	18	10	9	3	.....	—	—
7....	10.00	.....	350	175	6	33	3	.....	0	+
	12.00	.....	351	110	0	3	1	.....	—	—
	.....	4.00	352	90	3	3	1	.....	0	+
8....	10.00	.....	353	42	1	6	1	.....	0	0
	12.00	.....	354	50	3	3	1	.....	0	—
	.....	4.00	355	44	48	21	1	.....	0	0
9....	10.00	.....	356	28	4	1	2	.....	0	0
	12.00	.....	357	325	4	165	1	91.2	+	+
				98.0	8.7	22.1	1.5	94.5		
12....	12.00	.....	358	94	4	12	5	.....	—	—
	.....	4.00	359	31	4	6	5	.....	0	+
13....	10.00	.....	360	28	2	3	0	.....	—	—
	12.00	.....	361	21	2	8	1	.....	0	—
	.....	4.00	362	65	2	6	2	.....	0	0
14....	12.00	.....	363	60	1	10	1	.....	0	+
	.....	4.00	364	68	3	20	3	95.4	0	0
				52.4	2.5	9.28	2.4	74.2		
15....	12.00	.....	365	96	20	3	0	.....	0	0
	.....	4.00	366	17	0	6	0	.....	—	—

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
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APPENDIX A--

SAND

TANK "D"—RATE 12,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Effcy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
July 16....	10.00	.....	367	140	1	35	2	.....	+	+
	12.00	.....	368	280	0	51	0	96.8	+	+
				133.2	5.2	23.7	.5	97.8		
18....	.....	4.00	369	36	41	1	7	.....	0	+
19....	10.00	.....	370	67	0	6	1	.....	0	+
	12.00	.....	371	—	—	13	1	.....	0	0
	.....	4.00	372	100	7	12	1	.....	0	0
20....	10.00	.....	373	170	7	3	5	.....	+	—
	12.00	.....	374	126	5	80	1	.....	+	+
	.....	4.00	325	84	3	19	6	.....	0	+
21....	10.00	.....	376	115	1	45	2	.....	—	+
	12.00	.....	377	120	4	21	0	.....	—	0
	.....	4.00	378	120	2	64	4	.....	0	0
22....	10.00	.....	379	100	5	9	3	93.0	0	0
				103.8	7.5	24.8	2.8	88.7		
23....	10.00	.....	380	70	3	3	2	.....	0	0
	12.00	.....	381	70	1	2	1	97.2	+	+
				70	2	2.5	1.5	40.0		
26....	1.200	.....	382	500	15	15	8	.....	.....	.....
	.....	4.00	383	62	9	10	4	.....	0	+
27....	10.00	.....	384	95	12	12	5	.....	.....	.....
	12.00	.....	385	18	4	4	1	.....	.....	.....
	.....	4.00	386	145	14	—	6	.....	0	0
28....	10.00	.....	387	10	8	6	9	.....	0	+
	12.00	.....	388	145	3	11	9	.....	.....	.....
	.....	4.00	389	175	2	91	4	.....	+	+
29....	10.00	.....	390	65	9	7	2	.....	0	0
	12.00	.....	391	39	2	4	1	.....	0	0
30....	10.00	.....	392	350	7	3	2	.....	0	0
Aug. 2....	10.00	.....	393	10	2	7	1	.....	.....	.....
	12.00	.....	394	6	1	9	1	.....	.....	.....
3....	10.00	.....	395	10	0	3	1	.....	.....	0
	12.00	.....	396	10	4	3	1	.....	.....	0
4....	10.00	.....	397	7	0	2	0	.....	.....	0
	12.00	.....	398	39	1	27	0	.....	.....	0
5....	10.00	.....	399	181	15	4	0	92.0	0	0
				76.0	6.0	12.1	3.5	71.1		
5....	12.00	.....	400	91	8	0	2	.....	.....	0
6....	10.00	.....	401	24	2	1	1	.....	.....	.....
	12.00	.....	402	40	9	—	11	.....	.....	.....
8....	10.00	.....	403	80	1	0	0	91.5	.....	.....
				58.7	5	.3	3.5	.....		
10....	10.00	.....	404	13	3	1	3	.....	0	0
	12.00	.....	405	23	0	0	1	.....	0	0
11....	10.00	.....	406	58	0	47	0	.....	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
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—	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0	.....	.....
0	.....	0	0	.....	.....	.....	.....	—	.....	.....	.....	0	.....
0	.....	0	0	.....	.....	.....	.....	0	.....	.....	.....	0	.....
0	.....	0	0	.....	.....	.....	.....	0	.....	.....	.....	0	.....
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	+	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	0	.....	0

APPENDIX A—

SAND

TANK "D"—RATE 12,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910										
Aug. 11....	12.00	.....	407	58	1	17	0	.....	0	—
12....	10.00	.....	408	49	0	65	2	.....	—	0
	12.00	.....	409	52	3	20	1	.....	0	0
13....	10.00	.....	410	121	1	4	0	.....	0	0
	12.00	.....	411	93	0	1	1	.....	0	0
15....	10.00	.....	412	13	1	2	0	98.0	0	0
				53.3	1	17.3	.9	94.7		
16....	12.00	.....	413	17	4	0	0	.....	0	0
17....	12.00	.....	414	137	2	2	1	.....	0	0
18....	10.00	.....	415	127	2	10	4	97.0	0	—
				93.6	2.66	4	1.6	60.0		

RATE 5,000,000 GALLONS

30....	10.00	.....	416	233	82	12	77	.....	0	—
	12.00	.....	417	900	76	90	65	.....	—	—
31....	10.00	.....	418	140	42	8	38	.....	0	0
	12.00	.....	419	130	28	31	25	.....	+	+
	.....	4.00	420	60	26	4	21	.....	0	—
Sept. 1....	10.00	.....	421	280	19	34	19	.....	—	+
	12.00	.....	422	140	29	21	15	.....	+	+
2....	10.00	.....	423	1,440	18	7	12	.....	0	+
	12.00	.....	424	185	10	4	16	.....	+	+
	.....	4.00	425	164	16	36	10	.....	+	+
3....	10.00	.....	426	24	31	4	24	.....	0	+
	12.00	.....	427	18	7	6	8	.....	+	+
6....	10.00	.....	428	290	5	63	2	.....	.....	+
	12.00	.....	429	18	4	2	7	.....	.....	0
	.....	4.00	430	36	11	3	7	.....	—	+
7....	10.00	.....	431	130	11	11	6	.....	+	+
	12.00	.....	432	343	17	57	6	.....	.....	.....
	.....	4.00	433	150	12	3	4	.....	.....	.....
8....	10.00	.....	434	108	11	24	11	.....	+	+
	12.00	.....	435	62	4	11	9	.....	0	+
	.....	4.00	436	—	6	4	10	.....	.....	+
9....	10.00	.....	437	310	17	47	8	.....	—	+
	12.00	.....	438	224	15	32	8	.....	+	+
	.....	4.00	439	116	7	45	7	.....	+	+
10....	10.00	.....	440	265	7	17	16	.....	+	+
			stop'd	215.9	21.3	24.8	18.0			
12....	12.00	.....	442	600	15	240	7	.....	.....	.....
13....	10.00	.....	443	580	13	7	5	.....	.....	.....
14....	10.00	.....	444	2,000	23	80	34	.....	+	+
	12.00	.....	445	1,200	23	54	16	.....	+	+
	.....	4.00	446	900	13	25	2	.....	+	+
15....	10.00	.....	447	12	3	1	2	.....	+	+
	12.00	.....	448	16	3	3	3	.....	+	+
	.....	4.00	449	28	8	12	4	.....	+	+

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	+
0	.....	.....	—	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	..	+	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
+	.....	.....	0	.....	.....	0	0	0	.....	.....	0	.....	.....
0	.....	.....	0	.....	—	.....	.....	.....	.....	.....	0	.....	0
0	.....	..	0	.....	+	.....	.....	.....	.....	.....	0	.....	0

PER ACRE PER DAY.

—	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
0	.....	.....	+	.....	+	.....	.....	.....	.....	.....	—	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	+	.....	+
0	.....	.....	+	.....	—	.....	.....	.....	.....	.....	+	.....	+
+	.....	.....	+	.....	—	.....	+	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	—	+	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	—	—	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	0	+	.....	.....	+	.....	+
—	.....	.....	+	.....	+	.....	0	0	.....	.....	+	.....	+
+	.....	.....	+	.....	+	.....	0	—	.....	.....	—	.....	+
.....	.....	.....	—	.....	+	.....	0	.....	.....	.....	—	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	+
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	—
+	.....	.....	+	.....	+	.....	0	.....	.....	.....	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	0	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	+	.....	+	0	—	—	.....	.....	+	.....	—
+	.....	.....	+	.....	+	—	—	+	.....	.....	—	.....	+
+	.....	.....	+	.....	.....	.....	—	—	.....	.....	—	.....	.....
+	.....	+	.....	.....	.....	0	0	.....	—	.....	.....	.....	.....
.....	.....	.....	+	.....	+	.....	0	.....	.....	.....	—	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	—	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	+	.....	+	.....	+	.....	—	+	.....	.....	—	.....	0
.....	+	.....	+	.....	+	.....	0	0	.....	.....	—	.....	.....
.....	+	.....	+	.....	+	.....	0	—	.....	.....	—	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....

APPENDIX A—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date. 1910	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
Sept. 16....	10.00	.....	450	32	13	7	—	.....	0	+
	12.00	.....	451	9	5	—	—	.....	0	+
	.....	4.00	452	16	3	4	2	.....	—	+
17....	10.00	.....	453	12	4	—	—	.....	—	+
19....	10.00	.....	454	73	5	15	2	.....	—	+
	12.00	.....	455	23	1	11	1	.....	+	—
	.....	4.00	456	103	7	4	—	.....	+	+
20....	10.00	.....	457	35	6	3	0	.....	0	0
22....	.....	5.00	458	142	4	9	—	.....	0	+
23....	10.00	.....	459	96	4	1	1	.....	+	+
	12.00	.....	460	320	13	2	1	.....	0	0
24....	12.00	.....	461	43	6	—	5	.....	—	+
			stop'd	312	3.1	28.1	5.6			
27....	.....	4.00	462	—	—	.....	10	.....	0	—
28....	12.00	.....	463	536	9	44	10	.....	—	+
29....	.....	5.00	464	590	13	—	10	.....	0	—
30....	.....	5.00	465	710	6	69	10	.....	0	0
Oct. 1....	12.00	.....	466	51	2	45	9	.....	0	0
3....	.....	5.00	467	247	6	5	4	.....	0	0
4....	.....	4.00	468	30	9	55	1	.....	.....	0
5....	12.00	.....	469	21	6	35	5	.....	.....	0
6....	12.00	.....	470	34	2	6	1	.....	.....	+
7....	12.00	.....	471	141	19	13	2	.....	.....	+
8....	12.00	.....	472	145	1	1	1	.....	.....	0
10....	12.00	.....	473	153	3	2	0	.....	.....	0
11....	.....	4.00	474	200	24	2	1	.....	.....	.....
12....	12.00	.....	475	71	2	0	2	.....	0	0
13....	12.00	.....	476	28	7	3	5	.....	0	0
			stop'd	211.2	7.8	20.0	5.0			

RATE 10,000,000 GALLONS

Oct. 15....	12.00	.....	477	71	8	6	600	.....	0	0
17....	.....	5.00	478	388	1000	3	3	.....	0	+
18....	.....	5.00	479	180	61	9	9	.....	0	+
19....	.....	5.00	480	800	122	900	89	.....	0	0
20....	10.00	.....	481	640	63	50	9	.....	0	+
21....	.....	4.00	482	1200	11	359	7	.....	—	—
			stop'd	546.5	210.8	221.1	119.5			
24....	.....	4.00	483	240	1	6	2	.....	0	+
25....	10.00	.....	485	130	0	3	1	.....	0	—
26....	10.00	.....	486	196	0	5	2	.....	0	—
27....	12.00	.....	487	—	—	8	0	.....	0	0
28....	.....	5.00	489	37	4	9	9	.....	0	0
29....	12.00	.....	490	59	12	7	1	.....	0	0
Nov. 1....	10.00	.....	491	75	19	4	3	.....	0	0
2....	.....	3.30	492	4	3	3	0	.....	0	0
4....	.....	3.00	493	150	30	7	1	.....	0	0
5....	10.30	.....	494	52	5	6	3	.....	.....	.....
			stop'd	104.7	8.2	5.8	2.2			

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	.....	+	.....	.....	.....	—	—	.....	.....	—	.....	.....
+	.....	.....	+	.....	+	.....	0	0	.....	.....	0	.....	.....
+	.....	.....	+	.....	+	.....	—	—	.....	.....	—	.....	.....
—	.....	.....	+	.....	.....	.....	0	0	.....	.....	—	.....	.....
+	.....	.....	+	.....	.....	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	.....	.....	0	0	.....	.....	0	.....	.....
.....	+	.....	+	.....	+	.....	0	0	.....	.....	0	.....	0
.....	0	.....	0	.....	*0	.....	*0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	0
.....	—	.....	—	.....	+	.....	.....	.....	0	.....	—	.....	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	.....	+	.....	0
.....	0	.....	—	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	+	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	0

PER ACRE PER DAY.

.....	0	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	+
.....	+	.....	+	.....	+	.....	0	.....	.....	.....	0	.....	—
.....	0	.....	0	.....	+	.....	.....	.....	.....	.....	.....	.....	+
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	—	.....	+	.....	—	.....	0	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	0	.....	0	.....	0	.....	+
.....	+	.....	+	.....	+	0	0	.....	0	.....	0	.....	0
.....	—	.....	+	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	—	.....	0	0	0	.....	0	.....	0	.....	0
.....	—	.....	0	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	—	.....	—	.....	+	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	—	.....	0
.....	0	.....	—	.....	+	0	0	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0

*57°C–11C.

APPENDIX A—

SAND

TANK "D"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Bact. Eff'cy.	Influent. 1 C.C.	Influent. 5 C.C.
1910			No.484 omit'd							
Nov. 8....	11.30	.....	495	2	77	0	4	.....	0	0
9....	10.00	.....	496	1	8	3	0	.....	0	0
10....	10.00	.....	497	186	5	9	2	.....	0	0
				63.0	30.0	4.0	2.0			

RATE 3,000,000 GALLONS

Nov. 11....	.....	5.00	498	2	0	2	2	.....	0	0
12....	12.00	.....	499	12	4	3	1	.....	0	0
14....	10.00	.....	500	2	2	5	0	.....	0	0
15....	11.00	.....	501	0	0	2	1	.....	0	0
16....	12.00	.....	502	0	0	1	0	.....	0	0
17....	.....	5.00	503	0	4	0	3	.....	0	0
18....	11.30	.....	504	3	6	1	13	.....	0	0
19....	10.30	.....	506	0	23	1	0	.....	0	0
21....	.....	5.00	507	5	6	1	2	.....	0	0
22....	10.00	.....	508	8	2	8	0	.....	0	0
23....	.....	4.00	509	6	1	29	0	.....	0	0
24....	.....	5.00	510	1	0	1	0	.....	0	0
25....	10.30	.....	511	9	2	0	3	.....	0	0
26....	.....	1.00	512	5	1	4	0	.....	0	0
28....	10.00	.....	513	—	—	1	2	.....	0	0
29....	10.00	.....	514	—	—	11	1	.....	0	0
29....	10.00	.....	stop	3.7	3.64	4.37	1.75			
Dec. 2....	.....	5.00	515	2	4	2	1	.....	0	0
3....	12.30		516	14	1	9	0	.....	0	0
5....	.....	4.00	517	16	1	10	0	.....	0	0
6....	10.00	.....	518	22	0	6	0	.....	0	0
7....	.....	4.00	519	7	1	2	1	.....	0	0
8....	3.30	.....	520	56	1	4	2	.....	0	0
9....	.....	4.30	521	15	1	4	0	.....	.....	.....
10....	11.30	.....	522	100	0	—	—	.....	.....	.....
14....	.....	3.00	523	32	1	2	0	.....	0	0
15....	.....	5.30	524	22	1	5	1	.....	0	0
16....	.....	5.00	525	13	1	1	0	.....	0	0
16....	.....	5.00	stop	27.1	1.09	4.5	.5			
cleaned started Dec. 17										
19....	.....	3.00	526	45	0	2	0	.....	0	+
22....	.....	4.00	527	53	0	0	0	.....	0	0
27....	.....	4.00	528	50	2	—	1	.....	0	0
30....	.....	4.00	529	458	6	6	0	.....	0	0
Jan. 3....	.....	5.00	530	0	1	2	0	.....	+	0
				121.2	1.8	2.5	.2			

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	0	.....	0	.....	0	0	0	.....	0	0	.....	.....	0
.....	0	.... :	0	.....	—	0	0	.....	0	0	.....	.....	0
.....	0	.....	0	.....	+	0	0	.....	0	.....	—	.....	—

PER ACRE PER DAY.

.....	0	.....	0	.....	0	0	0	.....	0	.....	—	.....	+
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	0	0	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	....—	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	+
—	.....	.....	—	.....	+	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	....—	0	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	.....	—	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	++	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	+	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0
.....	+	.....	+	.....	+	.....	.....	.....	0	.....	0	.....	—
.....	0	.....	0	.....	0	.....	.....	.....	0	.....	0	.....	0

APPENDIX B.

APPENDIX B—
SAND

EXPERIMENTAL STATION. TANK A—RATE 5,000,000

Date	Hour A.M.	Hour P.M.	Serial No.	Bacterial Counts 18°-22°C Inf.	18°-22°C Eff.	37.5°C Inf.	37.5°C Eff.*	Influent. .001 C.C.	Influent. .005 C.C.
1911									
March 23	.....	5.00	1	2,400	21 (2)	3,100	18 (3)	.....	.....
24	.....	5.00	Stop						
25	11.00	Cleaned by scraping							
	12.45	.....	Start	.....	.....	.....	.....	.....	.....
	.....	1.00	2	14,000	950	2,320	120	.....	.....
27	.....	5.00	3	880	.....	.....	460	.....	.....
28	10.00	.....	4	16,000	3,170	45	252	.....	.....
28	.....	5.00	5	7,000 (740)	6,000 (10)	2,600 (320)	210 (40)	.....	.....
29	10.00	.....	6	243	1,240 (0)	30 (0)	35 (6)	.....	.....
	.....	5.00	7	30,000 (3,200)	3,700	3,600 (340)	14 (0)	.....	.....
30	10.00	.....	8	260	3,200	35 (0)	30	.....	.....
	.....	5.00	9	8,000 (600)	8,800	5,600 (1,120)	121 (7)	.....	.....
31	10.00	.....	10	9,000	9,200	2,000 (220)	94 (3)	.....	.....
	.....	5.00	11	8,500 (1,300)	6,000	3,850 (1,300)	880 (21)	0	.....
April 1	10.00	.....	12	7,800	2,400	3,950	440 (10)	0	.....
4	.....	5.00	13	13,000 (900)	70	4.500 (1,300)	16 (0)	00	.....
5	10.00	.....	14	8,800	10	2,600 (550)	6	0+	.....
	.....	5.00	Stop	9,500	3,730	2,760	206		
6	.....	4.00	Start	Cleaned by scraping					
6	.....	4.00	.....	7,200 (600)	100	2,600	27 (1)	.....	.....
	.....	4.08	.....	.....	14	.....	.....	.....	.....
	.....	4.15	.....	.....	33 (1)	.....	22	.....	.....
	.....	4.20	.....	.....	68 (2)	.....	35 (1)	.....	.....
	.....	4.30	.....	.....	250 (9)	.....	90 (4)	.....	.....
7	10.00	.....	17	5,100 (600)	63 (1)	3,500 (800)	15 (1)	0	—+
	.....	5.00	18	14,100	50 (8)	1,800	16 (0)	0	0—
8	.....	1.50	19	7,000	114	2,000	21 (0)	0	++
10	11.30	.....	20	5,000 (900)	12 (1)	1,560 (400)	2 (0)	0	++
	.....	5.00	21	12,000 (1,800)	20 (0)	6,300 (1,500)	12	0	—+
11	11.00	.....	22	28,000	53	3,700 (800)	3 (0)	+	.....
	.....	5.00	23	29,000	36	6,200 (2,200)	.....	0	.....

*Small figures Red Colonies on Litmus Lactose Agar.

Continued.
FILTERS.
GALS. PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	1.5 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.10 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	0	0	0	.....	.....	+	+	+	.....	+	+
.....	.....	.....	0	0	0	.....	.....	+	+	+	.....	+	+
+	.....	+	+	+	.....	0	—	+	+	+	+	.....	.....
.....	.....	.....	0	0	0	0	0	+	+	+	+	.....	+
+	.....	+	+	.....	+	0	0	+	+	+	+	.....	.....
.....	.....	.....	0	0	0	0	0	+	+	+	+	.....	+
+	.....	+ +	+	+	+	00	0	+	+	.....	.....	.....	.....
0+	.....	+	+	+	+	.....	+	+	+	+	.....	.....	.....
0+	.....	+	+	.....	.....	.....	0+	+	+	+	.....	.....	.....
++	.....	+	+	.....	.....	.....	0+	0	+	.....	.....	.....	.....
++	.....	.....	.....	.....	.....	.....	00	0	0	+	.....	.....	.....
—+	.....	.....	.....	.....	.....	.....	00	0	—	0	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	—	0	+	.....	+	.....
0	.....	.....	.....	.....	.....	0	0+	+	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	G —	G —	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	G —	0	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	0	0	0	.....	.....	.....
++	.....	.....	.....	.....	.....	.....	0	0	+	+	.....	+	.....
++	.....	....	.....	.....	.....	.....	0	0	0	+	.....	0	.....

+Positive reaction. —Doubtful or partial reaction. 0 No reaction at all.

APPENDIX B—
SAND

EXPERIMENTAL STATION. TANK "A"—RATE 5,000,000 GALLONS

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .005 C.C.
1911									
April 12	10.00	.....	24	3,400 18,000	17	800 3,900	3	0	.....
	.....	5.00	25	13,600	42	3,100	5	.....	.....
13	.....	5.00	26	11,400	9	3,500	2	.....	0
15	10.00	.....	27	19,000	8	4,700	2	.....	00
	.....	1.00	28	8,800	3	4,400	1	.....	00
			stop	13,720	53	3,640	17		
17	10.00	.....	29	.....	13	3,000	0	.....	0+*
	.....	1.00	30	40,000	36	7,300	3	.....	00
	.....	5.00	31	10,400	17	1,900	3	.....	00
18	10.00	.....	32	16,500	6	2,800	4	.....	00
	.....	1.00	33	14,000	6	3,400	4	.....	0
	.....	5.00	34	5,000	40	2,300	3	.....	0
19	10.00	.....	35	32,700	16	5,900	3	.....	.....
	.....	1.00	36	26,400	10	8,400	5	.....	0
	.....	3.00	cleaned	20,720	18	4,250	3		
	.....	5.00	37	15,300	200	9,000	15	.....	00
20	9.30	.....	started	.....	.....	.....	.....	.....	.....
	10.30	.....	38	30,000	277	8,200	6	.....	.....
	.....	5.00	39	8,200	240	2,400	15	.....	0
21	10.00	.....	40	2,600	400	170	6	.....	0
	.....	2.00	41	10,200	420	1,000	8	.....	00
	.....	5.00	42	13,800	270	2,000	7	.....	0
22	10.00	.....	43	8,200	54	2,300	12	.....	+
	.....	2.30	44	6,100	24	5,100	14	.....	0
24	10.00	.....	45	2,400	10	440	8	.....	.....
	10.00	.....	stop	10,200	212	2,710	9.5	.....	.....
	.....	2.30	46	2,400	13	180	3	.....	.....
April 24	.....	5.00	47	580	23	74	8	.....	.....
25	10.00	.....	48	500	20	36	7	.....	.....
	.....	1.00	49	.....	21	.....	0	.....	.....
25	.....	3.00	cleaned	1,160	19	97.	4.5	.....	.....
26	10.00	.....	started						
	10.00	.....	50	.....	.....	.....	10	.....	.....
	11.30	.....	51	100	42	30	6	.....	.....
	.....	5.00	52	116	32	13	7	.....	.....
27	10.00	.....	53	212	14	27	10	.....	.....
	.....	1.30	54	170	7	25	6	.....	.....
	.....	5.00	55	124	7	11	5	.....	.....
28	10.00	.....	Head in	orifice	Box 3 in	ches			
	10.30	.....	56	268	12	30	7	.....	.....
	.....	2.30	57	210	8	40	4	.....	.....
	.....	5.00	58	3,000	13	400	9	0	0
29	10.30	.....	59	12,000	13	4,000	4	0	0
	.....	1.00	60	7,600	14	1,500	.....	0	0
May 1	10.00	.....	stop	2,380	16.2	607.	6.8		

*More than one fermentation tube used.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
00	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0—	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	+	.....
0+	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	—
0+	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	+
++	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	+	+
0+	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	+	+
++	.....	.....	.....	.....	.....	.....	.....	.....	0	0	.....	0	+0
++	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
++	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
00	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	+	+
0+	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
0+	.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	+	.....
0+	.....	.....	.....	.....	.....	.....	.....	.....	.....	+	.....	+	+
++	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	..	+
—	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	+	+
0—	+	.....	.....	.....	.....	.....	.....	0	0	+	+	+	.....
0—	+	.....	.....	.....	.....	.....	.....	—	+	+	+	+	.....
0+	+	.....	.....	.....	.....	.....	.....	0	+	+	+	+	+
++	+	.....	.....	.....	.....	.....	0	0	+	+	+	+	+
.....	.....	0	—	+	+	.....	0	0	+	+	+	+	+
.....	.....	0	+	+	+	.....	.....	0	—	0	.....	+	+
.01	.05	.1	1.0	5	10	.01	.10	1.0	5	10	20	35	50
.....	.....	0	0	0	+	.....	.....	0	0	0	.....	0	+
.....	0	0	00	0	0	.....	.....	0	0	0	0	0	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	+
.....	0	.....	0	0	0	.....	.....	.....	.....	+	+	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	+	+0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	+	+ +0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	—	++
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	+	++
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	00
.....	.....	.....	.....	.....	.....	.....	.....	0	—0	0	.....	.....	.....
00	0	+	+	+	+	.....	.....	0	0	0	.....	0	00
00	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	+
—0	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	00

APPENDIX B—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .005 C.C.
1911									
May 1.....	10.00	.....	61	2,700	17	1,400	5	.....	.....
.....	.....	1.00	62	9,500	4	2,500	4	0	+
.....	.....	4.00	63	6,000	7	4,400	5	0	0
2.....	10.00	.....	64	6,400	15	3,700	6	0	0
.....	.....	4.00	65	5,600	13	4,200	6	.....	.....
3.....	10.30	.....	66	1,660	13	230	6	.....	.....
	1.00	.....	cleaned,	bottom	drained	afterwa	rds filled	from	"B."
4.....	11.45	.....	started	5,310	11.5	2,740	5.		
	11.45	.....	67	550	16	90	6	0	0
.....	.....	5.00	68	800	10	80	0	0	0
5.....	12.00	.....	69	209	25	6	3	.....	.....
.....	.....	5.00	70	200	20	.....	13	.....	.....
6.....	10.00	.....	71	1,260	8	.....	4	.....	.....
.....	.....	12.00	72	1,100	18	13	0	.....	.....
8.....	10.00	.....	73	700	24	.....	1	.....	.....
.....	.....	1.00	74	500	11	.....	2	.....	.....
.....	.....	4.00	75	.....	.....	.....	.....	.....	.....
.....	.....	5.00	76	1,800	10	.....	1	.....	.....
9.....	10.00	.....	77	14,300	23	1,620	3	.....	0
.....	.....	2.30	78	13,700	9	2,100	2	.....	0
.....	.....	5.00	79	14,700	14	2,050	5	0	0
10.....	12.00	.....	80	4,900	14	550	5	0	0
.....	.....	5.00	81	27,000	12	14,000	9	0	0
11.....	10.00	.....	82	13,000	10	3,400	1	0	—
.....	.....	2.00	83	17,300	8	2,430	3	0	+
	.....	2.00	stop	7,000	14.5	2,390	3.6		
.....	.....	5.00	84	17,700	27	6,600	3	0	+
12.....	11.00	.....	85	26,000	80	4,300	1	—	0
	.....	4.00	cleaned	21,850	53	5,450	2		
.....	.....	5.00	86	110,000	85	22,000	11	0	0
13.....	9.30	.....	start						
	10.30	.....	87	39,000	16	7,100	5	+	+
.....	.....	2.30	88	14,400	14	5,200	7	0	0
15.....	9.30	.....	c eaning	26,700	15	6,150	6		
16.....	10.30	.....	89	28,000	240	7,000	40	0	0
	12.00	.....	Finished	cleaning					
.....	.....	2.30	90	25,000	14	6,000	9	0	0
.....	.....	4.30	91	19,000	26	2,700	10	—	—
17.....	9.00	.....	start	22,000	20	4,350	95		
	11.00	.....	92	22,000	22	1,600	4	0	+
.....	.....	2.30	93	25,000	18	3,200	2	+	+
17.....	.....	5,00	94	30,000	22	4,000	5	0	0
18.....	11.00	.....	95	27,000	14	2,200	5	0+	0

Continued.

FILTERS.

PER ACRE PER DAY,

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0	+	.....	.....	+	+	.....	.....	0	0	0	.....	0	+ +
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	+	0
0	—	+	.....	.....	.....	.....	.....	0	0	0	.....	0	+
+	.....	..	.....	.....	.....	.....	.....	0	0	0	.....	+	0
.....	0	0	+	+	.....	.....	.....	.....	0	0	.....	0	0
0	0	0	+	.....	.....	.....	.....	0	0	0	.....	+	+
0	0	0	+	.....	.....	.....	.....	0	0	+	.....	+	+
.....	0	0	0	0	.....	.....	.....	.....	.....	0	—	—	+
.....	.....	0	0	0	.....	.....	.....	0	0	0	.....	+	0
.....	.....	.....	.....	0	0	.....	.....	.....	.....	+	.....	0	+
.....	.....	.....	0	0	+	.....	.....	.....	0	0	.....	0	+ +
.....	.....	.....	0	0	0	.....	.....	0	0	0	.....	0	0
.....	.....	.....	0	0	0	.....	.....	0	0	0	.....	0	+
.....	.....	.....	—	+	+	.....	.....	0	0	0	.....	+	+
+	+	+	+	+	.....	.....	.....	0	+	+	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	+	0	.....	+	+
+	—	+	+	.....	.....	.....	.....	0	0	+	.....	+	+
0	0	+	+	.....	.....	.....	.....	0	0	0	.....	+	0
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	+
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	0
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	0
+	+	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
0	0	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
0	+	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	0	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	.....	0	0	+	+	.....	+	+
+	+	+	+	.....	.....	.....	0	0	—	+	.....	+	+
+	+	+	+	.....	.....	.....	0	—	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	0	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	+	+

APPENDIX B—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date	Hour A.M.	Hour P.M.	Serial No.	Bacterial Counts. 18°–22°C Inf.	18°–22°C Eff.	37.5°C Inf.	37.5°C Eff.	.001 C.C.	.002 C.C.
1911									
	.....	2.00	96	19,000	24	4,000	15	+0	—
May 19.....	10.30	.....	97	28,500	32	4,800	4	0	0
	.....	1.30	98	26,500	16	7,300	8	0	+
	.....	5.00	stop	25,428	21.1	3,871	6.1		
	.....	5.00	99	.....	26	7,000	5	0	0
20.....	10.00	.....	100	150,000	200	38,000	17	—	0
	.....	1.00	101	100,000	28	35,000	5	0	0
22.....	.....	2.00	102	18,000	48	4,200	2	0	0
	.....	3.00	cleaned	8,9333	75.5	2,105	7.2		
	.....	5.00	103	24,000	1360	6,400	77	0	0
23.....	10.00	.....	104	31,400	90	7,900	11	0	0
	.....	1.15	start	27,700	1,450	7,150	44		
	.....	1.15	105	31,000	122	13,500	10	0	0
	.....	1.20	106	.....	90	.....	.....	.....	.....
	.....	1.35	107	.....	105	.....	24	.....	.....
	.....	1.45	108	.....	90	.....	27	.....	.....
	.....	1.55	109	.....	87	.....	26	.....	.....
	.....	2.15	110	.....	142	.....	45	.....	.....
	.....	2.30	111	.....	114	.....	40	.....	.....
	.....	3.30	112	.....	146	.....	22	.....	.....
	.....	4.30	113	.....	180	.....	77	.....	.....
	.....	5.00	114	41,000	152	4,600	22	+	+
	.....	5.00	stopover 36 hours	36,000	122.8½	9,050	32.7		
25.....	10.00	.....	start						
	10.00	.....	115	280,000	45	36,000	4	—	—
	.....	2.00	116	53,200	480	8,000	44	0	0
	.....	5.00	117	90,000	152	15,000	11	+	+
26.....	10.30	.....	118	10,800	85	900	26	0	0
	.....	1.30	119	13,400	31	3,600	23	0	+
	.....	5.00	120	10,000	35	3,000	8	0	0
27.....	10.00	.....	121	15,500	20	2,200	8	0	0
	.....	12.00	122	20,000	26	7,300	13	0	0
	.....	12.00	stop	61,612	109.2	9,500	17.1		
29.....	10.00	.....	123	150,000	8	7,000	0	0	0
	12.00	.....	124	84,000	13	8,600	4	0	0
	12.00	.....	start	117,000	10.5	7,800	2		
31.....	10.00	.....	125	13,400	84	2,400	28	0	0
	.....	1.30	126	120,000	76	10,700	34	0	+
	.....	5.00	127	.....	40	.....	18	0	0
June 1.....	10.00	.....	128	60,000	37	9,600	14	0	0
	.....	1.00	129	50,000	70	9,700	7	0	0
	.....	4.00	130	22,000	64	10,300	12	0	0
2.....	10.00	.....	131	28,000	24	8,000	2	0	0

Continued.

FILTERS.

PER ACRE PER DAY

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
+	+	.....	.....	.....	.....	.....	+	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	0+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	+	.....
+	+	.....	.....	.....	.....	.....	0	0	0	+	+	+	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	+	.....	.....
+	+	.....	.....	.....	.....	.....	.....	0	+	+	+	+	.....
0	0	.....	.....	.....	.....	.....	0	0	0	+	+	.....	+
+	+	.....	.....	.....	.....	.....	+	+	+	.....	+	+	.....
+	+	.....	.....	.....	.....	0/2	0	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	.....	+	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	—	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	0	—	—	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	+	+	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	—	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	.....	0	+	+	.....	+	+
+	+	+	.....	.....	.....	.....	.....	0	+	+	.....	+	+
—	+	+	.....	.....	.....	0	0	+	+	+	.....	+	.....
+	+	+	.....	.....	.....	0	0	0	+	+	+	+	.....
0	0	0	.....	.....	.....	0	0	0	+	+	.....	+	+
+	—	.....	.....	.....	.....	0	0	0	+	+	.....	+	.....
+	—	.....	.....	.....	.....	0	0	0	+	+	.....	+	.....
+	0	.....	.....	.....	.....	0	0	0	0	+	.....	+	.....
+	+	.....	.....	.....	.....	0	0	0	—	+	.....	+	.....
+	+	.....	.....	.....	.....	.....	.....	0	0	-	0	.....	+
—	+	.....	.....	.....	.....	0	0	0	0	0	0	.....	+
+	+	.....	.....	.....	.....	.....	0	—	+	+	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	—	+	+	+	.....	.....
0	0	.....	.....	.....	.....	.....	0	—	—	+	+	+	.....
0	+	.....	.....	.....	.....	0	0	0	+	.....	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+	.....	+	.....	.....
+	+	.....	.....	.....	.....	.....	.....	+	+	.....	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....

APPENDIX B—

SAND

TANK "A."—5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
June 2.....	.....	2.30	132	19,000	23	3,300	4	0	0
	.....	5.00	133	300	34	400	6	0	0
3.....	10.00	.....	134	45,000	17	6,000	6	0	0
	.....	1.00	135	38,000	12	5,800	6	0	0
5.....	10.00	.....	stop	39,570	43.7	6,620	12.4		
	.....	2.30	start						
	.....	2.30	136	92,000	11	15,400	5	0	0
6.....	10.00	.....	stop						
	11.00	.....	137	9,000	70	1,850	40	.....	.....
	.....	1.00	138	12,000	105	2,400	63	.....	.....
7.....	10.00	.....	139	1,500	15	90	5	.....	.....
	.....	1.30	140	2,400	17	2,400	10		0
	.....	5.00	141	2,400	7	900	3	.....	.....
8.....	10.00	.....	142	3,000	8	120	3	.....	.....
	11.00	drained f	rom bot-	5,050	37	1,295	20.6		
		3.00	tom cleaned						
	.....	5.00	143	500	166	93	50	.....	.....
9.....	.....	1.30	144	700	65	——	3	.....	.....
10.....	10.00	.....	start	600	115.5	93	26.5	.....	.....
	10.00	.....	145	1,296	8	15	4	.....	.....
	.....	1.00	146	1,160	26	2	5	.....	.....
	.....	1.00	stop	1,228	17	8.5	4.5	.....	.....
11.....	10.30	.....	start						
12.....	10.30	.....	147	1,000	23	185	3	.....	.....
	.....	1.00	148	830	21	64	9	.....	.....
	.....	4.00	149	190	18	18	4	.....	.....
13.....	10.00	.....	150	400	14	17	9	.....	.....
	.....	12.00	151	280	14	18	6	.....	.....
	.....	4.00	152	112	8	7	6	.....	.....
14.....	11.00	.....	153	1,500	12	128	1	.....	.....
	.....	2.30	154	13,500	15	1,600	15	.....	.....
	.....	5.00	155	8,000	80	1,300	18	.....	.....
15.....	11.00	.....	156	15,000	50	4,600	25	—	0
	.....	1.00	157	12,500	44	3,500	23	0	0
	.....	4.00	158	7,500	43	1,420	13	0	0
16.....	10.00	.....	159	12,000	40	580	3	.....	.....
	.....	1.00	160	5,700	38	900	11	0	0
	.....	5.00	161	13,500	58	2,200	12	.....	0
17.....	10.00	.....	162	3,000	11	300	2	.....	.....
	12.00	.....	stop	5,937	30.5	1,052	10		
19.....	11.00	.....	163	14,000	7	600	6	0	0
20.....	10.00	.....	164	12,000	570	4,500	155	.....	0
	12.00	.....	165	9,000	1,040	12,000	85	0	0
	.....	3.00	166	25,000	1,000	7,500	86	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
—	—	.....	.....	.....	.....	.....	0	+	+	+	+	.....	.....
0	0	.....	.....	.....	.....	.....	0	+	+	+	.....	+	.....
+	+	.....	.....	.....	.....	0	0	0	+	+	+	.....	.....
+	0	.....	.....	.....	.....	0	0	0	0	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	0	+	+	+	.....
.....	0	+	+	+	+	.....	.....	—	—	+	+	.....	+
.....	0	+	+	+	+	0	+	+	+	+	+	.....	.....
.....	.....	0	—	—	+	0	0	-	+	.....	+	.....	.....
+	+	+	.....	.....	.....	0	—	+	+	+	+	.....	.....
.....	0	0	0	+	+	0	+	+	+	+	.....	.....	.....
.....	0	0	+	+	+	.....	0	—	+	+	+	.....	.....
.....	0	0	—	0	+	.....	0	—	+	+	+	.....	.....
.....	.....	.....	0	—	+	.....	0	0	+	+	+	.....	.....
.....	.....	.....	0	0	0	.....	0	0	0	+	.....	+	+
.....	.....	.....	0	0	+	.....	+	+	+	.....	.....	+	+
.....	.....	.....	0	0	+	.....	.....	0	+	+	.....	+	+
.....	.....	.....	0	0	0	.....	.....	—	+	+	.....	+	+
.....	.....	.....	0	—	+	.....	.....	0	0	0	.....	0	0
.....	.....	.....	0	0	0	.....	.....	0	+	+	.....	+	+
.....	.....	.....	0	—	+	.....	.....	0	—	+	.....	+	+
.....	.....	.....	0	0	0	.....	.....	+	+	+	.....	+	+
0	0	+	.....	+	+	.....	0	0	0	+	.....	+	.....
0	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	0	.....	.....	.....	0	0	—	+	+	+	.....	.....
+	+	+	.....	.....	.....	0	0	0	+	+	+	.....	.....
0	0	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	+	.....	.....	.....	0	0	0	+	+	.....	+	.....
0	0	.....	.....	.....	.....	0	0	—	+	+	.....	+	.....
0	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	+	+	.....	.....	0	0	0	+	+	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	0	—	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	0	0	+	+	+	.....	.....	.....

APPENDIX B—

SAND

TANK "A"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
June 21	10.30	.....	167	20,000	900	2,350	26	.....	.....
.....	.....	2.00	168	7,300	270	1,170	30	.....	.....
	3.00	raked &	started	14,550	631.1	4,686.7	64.7	.....	.....
.....	.....	5.00	168	15,300	200	2,000	32	.....	.....
22	.....	.....	stop						
23	11.00	.....	start						
24	11.00	.....	stop						
26	10.30	.....	start						
	10.30	.....	169	11,400	12	3,200	2	.....	0
.....	2.00		170	18,000	115	6,000	40	.....	.....
.....	4.30		171	11,500	62	3,800	28	.....	.....
27	10.00	.....	172	27,000	200	6,500	40	.....	.....
.....	3.00		173	12,500	136	4,000	43	.....	.....
28	11.00	.....	174	18,000	42	8,500	.....	.....	+
	12.00	.....	175	22,600	43	9,300	.....	.....	0
.....	2.00		176	30,000	54	18,500	11	.....	0
.....	2.00		stop.						
			filter not	cleaned	18,875	83	7,475	27.3	
29	10.00	.....	start						
	10.30	.....	177	300,000	57	6,000	7	+	+
.....	2.30		178	200,000	200	7,000	23	.....	+
.....	3.30		179	300,000	130	5,100	11	+	+
30	10.00	.....	180	120,000	74	6,000	8	+	+
	10.00	.....	stop	230,000	115.2	6,025	12.2		
	12.00	.....	181	88,000	.....	3,100	4	+	+
July 3	10.00	.....	182	90,000	10	650	3	0	0
	12.00	.....	183	300	54	5,000	10	0	0
.....	5.00		184	300	42	600	25		
				44,650	35.3	2,337.5	10.5		
.....	.....	5.00	raked						
4	10.00	.....	start						
	12.30	.....	185	7,300	93	1,000	72	.....	.....
.....	4.00		186	1,200	51	600	22	.....	.....
5	10.00	.....	187	1,600	51	100	13	0	0
.....	1.00		188	1,300	40	150	13	0	0
.....	5.00		189	7,600	46	3,500	21	0	0
6	10.00	.....	stop	3,800	56.2	1,070	28.2		
.....	1.00		start						
.....	1.00		190	850	26	300	12	0	0
.....	2.00		191	2,300	55	1,200	10	0	0
.....	5.00		192	2,400	78	100	24	0	0
7	10.00	.....	193	1,340	35	380	14	0	0
.....	2.00		194	2,700	50	930	16	0	0
.....	5.00		stop	1,918	48.8	582	15.2		
10	.....	1.00	195	8,100	2	1,840	1	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0	0	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	+	+	.....	0	+	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	+	+	.....	.....	.....	0	0	0	0	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
—	+	+	.....	.....	.....	+	+	0+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
0	+	+	.....	.....	.....	0	0	—	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	0	+	+	.....	.....	.....	.....
+	0	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	0	0	0	0	+	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	0	0	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
0	+	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
+	+	+	+	.....	.....	0	0	0	+	+	.....	.....	.....

APPENDIX B—

SAND

TANK A—RATE, 5,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
July 11.....	12.00	.....	197	1,740	1,400	300	560	0	0
.....		5.00	198	.....	.....	1,500	800	.....	.....
12.....	10.00	.....	199	1,200	6,000	25	400	.....	.....
	10.00	.....	start	3,680	2,467	916.2	440.2		
.....		1.00	.....	300	2,500	5	300	.....	.....
.....		5.00	.....	70	30	7	20	.....	.....
13.....	10.00	.....	200	20	150	24	19	.....	.....
	10.00	.....	stop	130	983	12	113	.....	.....
		2.00	raked						

RATE CHANGED TO 10,000,000

14.....	10.30	.....	start						
	10.30	.....	201	6,000	200	3,500	25	.....	.....
	10.45	.....	202	.....	.....	.....	43	.....	.....
	10.55	.....	203	.....	.....	.....	60	.....	.....
	11.05	.....	204	.....	.....	.....	88	.....	.....
	11.15	.....	205	.....	.....	.....	88	.....	.....
	11.30	.....	206	.....	.....	.....	54	.....	.....
	11.45	.....	207	.....	.....	.....	60	.....	.....
	12.00	.....	208	8,000	320	3,000	58	0	0
	12.30	.....	209	.....	.....	.....	82	.....	.....
.....		1.00	210	.....	.....	.....	74	.....	.....
.....		2.00	211	.....	.....	.....	122	.....	.....
.....		2.30	212	.....	.....	.....	144	.....	.....
.....		3.00	213	.....	.....	.....	138	.....	.....
.....		5.00	214	2,400	1,000	1,400	390	.....	.....
15.....	10.00	.....	215	500	270	100	110	0	0
.....		1.00	216	7,000	253	4,000	107	+	.....
17.....	10.00	.....	217	200	106	11	21	.....	.....
.....		1.00	218	6,000	95	300	24	.....	.....
.....		5.00	219	700	80	113	21	.....	.....
18.....	10.30	.....	220	40	24	4	13	.....	.....
	10.30	.....	stop	3,426.6	260.7	1,380.7	86.1		
.....		2.00	raked						
.....		4.00	221	282	214	1	60	.....	.....
19.....	10.00	.....	start						
	10.00	.....	222	1.300	42	370	9	.....	.....
	12.00	.....	223	4,000	54	2,600	23	.....	+
.....		5.00	224	6,400	82	3,000	34	0	0
20.....	10.00	.....	225	10,500	60	2,340	30	0	+
20.....	.....	2.00	226	9,500	76	2,000	18	0	0
21.....	10.00	.....	227	7,500	23	1,700	16	0	.....
22.....	12.00	.....	228	900	27	500	9	0	0
.....		1.00	229	13,500	29	7,100	8	.....	.....
24.....	10.00	.....	230	6,700	7	1,500	3	0	.....
	10.00	.....	stop	6,600	44.4	2345.5	16.6		
	12.00	.....	raked						

Continued.

FILTERS.

GALS. PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
0	+	+	+	.....	.....	+	+	+	+	.....	.....	.....	.....
0	.....	+	+	+	.....	+	+	+	+	.....	.....	.....	.....
0	0	0	—	—	+	0	—	+	+	.....	.....	.....	.....
0	0	0	0	.....	.....	+	+	+	+	.....	.....	.....	.....
0	0	0	.....	—	—	0	0	+	+	.....	.....	.....	.....
0	0	0	0	0	+	0	0	+	+	+	.....	.....	.....

GALLONS PER 24 HOURS.

.....	.....	.....	+	+	+	0	+0	+	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	+	+	.....	.....	0	—+	+	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	+	+	.....	.....	0	—+	+	.....	.....	.....	.....	.....
.....	0	0	.....	.....	.....	—	0+	+	.....	.....	.....	.....	.....
0	+	.....	.....	.....	.....	—	—+	+	.....	.....	.....	.....	.....
0	0	0	0	0	+	0	+0	+	+	.....	.....	.....	.....
0	0	0	+	+	+	0	00	+	+	.....	.....	.....	.....
.....	.....	0	+	+	+	0	00	+	+	.....	.....	.....	.....
0	0	0	0	0	0	0	0	+	+	+	.....	.....	.....
0	0	0	0	+	+	0	0	+	+	.....	.....	.....	.....
0	+	+	+	+	.....	.....	0	+	+	+	.....	.....	.....
.....	+	+	+	+	.....	.....	+	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	—	—	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "A"—RATE 10,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
July 25	10.00	.....	start						
	10.00	.....	231	22,400	43	9,300	6	+	+
	10.10	.....	232	.....	.....	.....	18	.....	.....
	10.20	.....	233	.....	.....	.....	23	.....	.....
	10.35	.....	234	.....	.....	.....	46	.....	.....
	11.30	.....	235	.....	.....	.....	58	.....	.....
	11.30	.....	stop, city	closed	valve	filter not	cleaned		
	.....	1.00	236	17,000	97	7,300	25	—	+
	.....	3.00	start						
	.....	5.10	237	10,000	144	2,300	68	0	0
26	10.00	.....	238	46,600	325	30,000	200	—	+
	.....	1.00	239	44,000	370	26,000	160	—	0
	.....	5.00	240	28,000	370	12,000	150	+	+
27	10.00	.....	241	13,000	200	4,000	90	+	0
	12.00	.....	242	9,700	165	2,700	40	0	+
	.....	5.00	243	7,000	100	900	30	0	0
28	10.00	.....	244	4,700	37	1,800	32	0	0
	10.00	.....	stop						
				20,240	185.1	9,530	67.6		
	.....	3.00	raked						
29	10.00	.....	start						
	10.00	.....	245	3,300	32	800	11	0	0
	.....	5.00	246	2,200	50	300	19	0	0
31	10.00	.....	stop	2,750	41	550	15	.....	.....
	10.00	.....	247	1,300	24	800	2	0	0
	.....	4.00	raked						
Aug. 2	10.20	.....	start						
	10.20	.....	248	17,000	.....	3,860	48	.....	.....
	10.30	.....	249	.....	.....	.....	60	0	0
	10.40	.....	250	.....	900	.....	.....	.....	.....
	10.55	.....	251	.....	.....	.....	270	.....	.....
	11.00	.....	252	.....	.....	.....	550	.....	.....
	11.10	.....	253	.....	.....	.....	530	.....	.....
	11.30	.....	254	.....	.....	.....	350	.....	.....
	11.45	.....	255	.....	.....	.....	375	.....	.....
	12.00	.....	256	.....	1,100	.....	130	.....	.....
	12.30	.....	257	.....	.....	.....	120	.....	.....
	.....	1.00	258	12,000	.....	2,080	38	—	—
	.....	2.00	259	.....	.....	.....	40	.....	.....
	.....	3.00	260	.....	.....	.....	21	.....	.....
	.....	3.30	261	.....	.....	.....	19	.....	.....
	.....	5.00	262	12,000	80	3,200	13	.....	0
3	10.00	.....	263	24,000	40	4,700	14	0	+
	.....	2.00	264	21,000	40	4,000	14	0	0
	.....	6.00	265	67,000	30	4,700	2	0	0
4	11.00	.....	266	72,000	30	—	13	0	+
	.....	1.00	267	42,000	19	2,200	6	0	0
	.....	4.00	268	17,000	35	3,000	3	0	0
5	10.00	.....	269	200,000	5	15,000	2	+	+
7	10.00	.....	stop	48,400	226.9	3637.7	124.7		

Continued.

FILTERS.

GALLONS PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
+	+	.....	.....	.....	.....	.....		+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
+	0	.....	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	—	—	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	.....	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	.....	0+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	.....	—+	+	+	.....	.....	.....	.....
0	.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	.....	0	—	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	.....	—	—	+	+	.....	.....	.....
+	+	+	.....	.....	.....	.....	+0	+	+	+	.....	.....	.....
+	0	+	.....	.....	.....	.....	0	—	+	+	.....	.....	.....
+	+	+	.....	.....	.....	.....	0+	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	.....	0+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	—	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	—	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "A"—RATE 10,000,000

EXPERIMENTAL STATION.

Date.	Hour.		Serial No.	Bacterial Counts.				Influent.	
	A.M.	P.M		18°–22°C.		37.5°C.			
				Inf.	Eff.	Inf.	Eff.	.001 C.C.	.002 C.C.
1911									
Aug. 9.....	.....	4.00	cleaned	scraped					
10.....	11.10	.....	start						
10.....	11.10	.....	270	30,000	63	10,000	1	.....	.....
	11.20	.....	271	.....	.....	.....	4	.....	.....
	11.30	.....	272	.....	.....	.....	1	.....	.....
	11.40	.....	273	.....	.....	.....	10	.....	.....
	11.50	.....	274	.....	.....	.....	58	.....	.....
	12.00	.....	275	30,000	260	10,000	80	.....	0
	12.15	.....	276	.....	.....	.....	81	.....	.....
	12.30	.....	277	.....	.....	.....	100	.....	.....
	12.45	.....	278	.....	.....	.....	110	.....	.....
	.....	1.30	279	.....	.....	.....	112	.....	.....
	.....	2.00	280	.....	.....	.....	110	.....	.....
	.....	2.30	281	.....	.....	.....	80	.....	.....
	.....	2.20	282	.....	.....	.....	66	.....	.....
	.....	4.30	283	7,500	320	3,300	50	.....	0
11.....	10.00	.....	284	12,000	280	2,000	115		0
				16,875	230.7	6,325	65.2		

Continued.

FILTERS.

GALLONS PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
—	+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....
—	+	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	0	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	++	+	+	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "B"—RATE 5,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .01 C.C.
1911									
March 23	.....	5.00	1	2,400	1,660	3,100	250 (20)	.....	.....
25	1.00	.....	2	14,000	heavy	2,320	280	.....	.....
27	.....	5.00	3	880	.....	.....	1,340	.....	.....
28	10.00	.....	4	16,000	6,000	45	970	.....	.....
28	.....	4.30	stop	10,320	3,830	1,822	720		
	.....	5.00	5	7,000 (740)	.....	2,600 (320)	300 (0)	.....	0+
29	10.00	.....	6	243	.....	30 (0)	34 (4)		
	110.0	.....cleaned, 1st cleaning for the quartz sand filter, top hard and							
	.....	4.00	start						
	.....	5.00	7	30,000 (3200)	.....	3,600 (340)	160 (68)		+
30	10.00	.....	8	260	4,300 (0)	35 (0)	150 (10)	.....	.....
	.....	5.00	9	8,000 (600)	3,000	5,600 (1120)	150 (24)	.....	+
31	10.00	.....	10	9,000	46,500	2,000	.....	.....	0+
	.....	5.00	11	8,500 (1300)	35,500	3,850 (1300)	900 (62)	0	0+
April 1	10.00	.....	12	7,800	46,400	3,950	1,410 (45)	0	++
	.....	5.00	.....	.....	.....	.....	.....	.....	.....
4	.....	5.00	13	13,300 (900)	3,000	4,500 (1300)	112 (42)	00	++
5	10.00	.....	14	8,800	730	2,600 (550)	50 (11)	0+	—+
	.....	5.00	stop	10,707	19,918	3,267	417		
6	.....	4.00	start; cleaned by scraping						
	.....	4.00	15	7,200 (600)	51	2,600	11	.....	.....
	.....	4.08	16	.....	16	.....	22	.....	.....
	.....	4.15	16	.....	77 (4)	.....	49 (2)	.....	.....
	.....	4.20	16	.....	134 (5)	.....	90 (2)	.....	.....
	.....	4.30	16	.....	141 (1)	.....	45 (2)	.....	.....
7	10.30	.....	17	5,100 (600)	.....	3,500 (800)	36 (8)	0	—+
	.....	5.00	18	14,100	470 (13)	1,800	47 (15)	0	—0
8	.....	1.00	19	7,000	3,000	2,000	66	0	++
10	11.30	.....	20	5,000 (900)	2,900	1,560 (400)	6	0	++
10	.....	5.00	21	12,000 (1800)	320 (14)	6,300 (1500)	50 (3)	0	—+
11	11.00	.....	22	28,000	1.680	3,700 (800)	35 (0)	+	++

Small figures Red Colonies on Litmus Lactos Agar.

Continued.

FILTERS.

GALLONS PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.1 C.C.	1 C.C.	5 C.C.	10 C.C.	30 C.C.	50 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	0	0	0	+	.....	.....	—	—	+	.....	+	+
.....	0	0	0	0	+	.....	.....	—	+	+	.....	+	+
+	+	+	.....	.....	.....	0	0	+	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	0	0	+	.....	+	.....	.....	+
firm with water out													
+	+	.....	+	+	+	—	+	+	.....	+	+	.....	.....
.....	0	0	0	+	+	0	+	+	+	+	+	.....	.....
++	+	+	+	+	+	0	++	+	+	.....	.....	.....	.....
+	+	+	+	.....	.....	.....	+	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	.....	++	+	+	+	+	.....	.....
+	.....	.....	.....	.....	.....	.....	++	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	—+	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	00	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	+	.....
0	+	+	.....	.....	.....	.....	—0	—	—	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	+—	—	—	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	+	.....	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	0	+	+	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....

APPENDIX B—

SAND

TANK B.—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .01 C.C.
1911									
	.....	5.00	23	29,000	.....	2200 6,200	.....	0	++
April 12.....	11.00	.....	24	3400 18,000	1,500	3,900	40	0	00
	.....	5.30	25	13,600	1,800	3,100	40	.....	.....
13.....	.....	5.30	26	11,400	370	3,500	30	0	—0
15.....	10.00	.....	27	19,000	470	4,700	34	00	0+
	.....	1.00	stop	14,250	1,265	3,572	40		
	.....	1.00	28	8,800	670	4,400	23	00	0+
17.....	10.00	.....	29	.....	86	3,000	17	0+	++
	.....	1.00	30	40,000	96	7,300	8	00	0+
	.....	5.00	31	10,400	225	1,900	8	00	++
18.....	10.00	.....	32	16,500	13	2,800	11	00	++
	.....	1.00	33	14,000	15	3,400	15	0	++
	.....	5.00	34	5,000	26	3,400	10	0	00
19.....	10.00	.....	35	32,700	250	5,900	9	.....	0+
	12.00	.....	cleaned	18,200	173	4,012	13		
	.....	1.00	36	26,400	2,600	8,400	10	0	0+
	.....	4.00	stop						
	.....	5.00	37	15,300	87	9,000	38	00 .001	0+ .005
20.....	10.00	.....	38	30,000	240	8,200	22	.....	0
	.....	5.00	39	8,200	370	2,400	22	0	0
21.....	10.00	.....	40	2,600	110	170	10	0	.....
	.....	2.00	41	10,200	100	1,000	13	00	0
	.....	5.00	42	13,800	216	2,000	7	0	0
22.....	10.00	.....	43	8,200	130	2,300	.....	+	—
	10.00	.....	stop	12,614	179	3,581	18.7		
	.....	2.30	44	6,100	50	5,100	20	0	0
24.....	10.00	.....	45	2,400	22	440	10	.....	.....
24.....	.....	2.30	46	2,400	33	180	4	.....	.....
	.....	5.00	47	580	88	74	5	.....	.....
25.....	10.00	.....	48	500	57	36	4	.....	.....
	.....	1.00	49	.....	114	—	8	.....	.....
	.....	4.00	cleaned	2,396	60.5	1,166	8.5		
26.....	10.00	.....	start						
	10.00	.....	50	360	30	21	4	.....	.....
	11.30	.....	51	100	1,310	30	34	.....	.....
	.....	5.00	52	300	290	13	17	.....	.....
27.....	10.00	.....	53	212	270	27	13	.....	.....
	.....	1.30	54	170	233	25	9	.....	.....
	.....	5.00	55	124	310	11	12	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	30 C.C.	50 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	0	+	+	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	0	+	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	0	—	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	0	0	+	0	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	0+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	0	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	+	+
.01	.05	.10	1.	5	10								
++	.....	.....	.....	.....	.....	.....	.....	+	+	.....	.....	.....	.....
—	.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	+	+
0—	+	.....	.....	.....	.....	0	0	+	+	+	+	.....	.....
0—	+	.....	.....	.....	.....	0	0	+	+	+	+	.....	.....
0	+	.....	.....	.....	.....	0	—	+	+	+	.....	+	.....
0+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	+	+
++	+	.....	.....	.....	.....	0	+	+	+	+	.....	+	+
.....	.....	0	—	+	+	0	0	0	0	.....	.....	0	+
.....	.....	0	+	+	+	.....	.....	0	0	0	.....	0	D —
.....	.....	0	0	0	+	.....	.....	0	0	0	.....	+	+
.....	.....	0	00	0	0	.....	.....	0	0	0	.....	00	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	D —
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	0
.....	.....	.....	0	0	0	.....	.....	.....	.....	+	+	+	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	+	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	0	—	—	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	+	+

APPENDIX B—

SAND

TANK "B"—RATE 5,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .005 C.C.
1911									
April 28.....	10.00	.....	56	268	180	30	5	.....	.....
.....	.....	2.30	57	210	164	40	16	.....	.....
.....	.....	5.00	58	3,000	140	400	9	0	00
29.....	10.00	just tric	kling	527	325	66.3	13		
		from	orifice.						
	10.00	.....	59	12,000	64	4,000	10	0	0
.....	1.00		60	7,600	26	1,500	4	0	0
May 1.....	10.00	.....	61	2,700	50	1,400	26	.....	.....
.....	1.00		62	9,500	18	2,500	12	0	+
.....	4.00		63	6,000	22	4,400	8	0	0
2.....	10.30	.....	64	6,400	36	3,700	9	.....	.....
.....	4.00		65	5,600	18	4,200	14	.....	.....
3.....	10.30	.....	66	1,660	250	230	6	0	0
	11.00	.....	cleaned	6,430	60.5	2,741	11		
4.....	11.45	.....	start						
	11.45	.....	67	550	33	90	9	.....	0
.....	5.00		68	880	153	80	9	.....	0
5.....	12.30	.....	69	209	150	6	12	.....	.....
.....	5.00		70	200	240	.....	10	.....	.....
6.....	10.00	.....	71	1,260	29	.....	8	.....	.....
.....	12.00		72	1,100	960	13	22	.....	.....
8.....	10 00	.....	stop	700	261	47	11	.....	.....
	10.00	.....	73	700	150	.....	5	.....	.....
.....	1.00		74	500	32	.....	0	.....	.....
.....	5.00		75	1,800	54	.....	3	.....	.....
9.....	10.00	.....	76	14,300	46	1,620	.....	.....	0
.....	1.00		77	13,700	40	2,100	2	.....	0
.....	5.00		78	14,700	33	2,050	2	0	0
10.....	12.00	.....	79	4,900	50	550	11	0	0
.....	5.00		80	27,000	33	14,000	6	0	0
11.....	10.00	.....	81	13,000	48	3,400	4	0	+
.....	2.00		82	17,300	140	2,430	4	0	+
.....	5.00		83	17,700	700	6,600	103	0	+
12.....	11.00	.....	84	26,000	70	4,300	14	—	0
	.....	3.00	cleaned	12,620	116	4,116	14		
.....	5.00		85	110,000	107	22,000	8	0	0
13.....	9.30	.....	start						
	10.30	.....	86	39,000	73	7,100	25	+	+
.....	2.30		87	14,400	187	5,200	56	0	0
15.....	9.00	.....	stop	26,700	130	6,150	40.5		
16.....	10.00	.....	88	28,000	26	7,000	7	0	0
	.....	2.30	89	25,000	24	6,000	2	0	0

Continued.

FILTERS,

GALLONS PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1. C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	0	0	G — D	+	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	—	+	+	+
0	0	+	+	+	+	.....	.....	0	0	+	.....	+	+
00	+	+	+	.....	.....	.....	.....	0	0	0	.....	+	0
0—	+	+	+	.....	.....	.....	.....	0	0	0	.....	—	0
0	+	.....	.....	+	+	.....	.....	0	0	0	.....	+	+ +
+	+	+	.....	+	.....	.....	.....	0	0	0	.....	0	0
+	+	+	.....	+	.....	.....	.....	0	0	0	.....	+	+
0	—	+	.....	.....	.....	.....	.....	0	0	0	.....	0	+
+	.....	+	.....	.....	.....	.....	.....	0	0	0	.....	+	+
.....	0	0	+	+	.....	.....	.....	.....	0	0	.....	+	+
0	0	0	+	.....	.....	.....	.....	.....	0	0	.....	0	0
0	0	0	+	0	.....	.....	.....	0	+	+	.....	+	+
.....	0	0	0	0	0	.....	.....	0	.....	+	.....	+	+
.....	.....	0	0	0	0	.....	.....	0	.....	+	.....	+	+
.....	.....	.....	.....	0	0	.....	.....	.....	0	0	.....	+	+
.....	.....	0	.....	0	+	.....	.....	.....	0	—	.....	+	+
.....	.....	0	.....	0	0	.....	.....	0	0	0	.....	0	+
.....	.....	0	.....	0	0	.....	.....	0	0	0	.....	0	0
.....	.....	—	.....	+	+	.....	.....	0	0	0	.....	0	0
+	+	+	+	+	.....	.....	.....	0	0	0	.....	0	0
+	+	+	+	+	.....	.....	.....	0	0	0	.....	0	+
—	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	0
0	0	+	+	.....	.....	.....	.....	0	0	0	.....	+	0
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	+
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	0
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	0
+	+	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
0	0	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
0	+	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	0	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	.....	0	0	+	+	.....	+	+

APPENDIX B—

SAND

TANK "B"—RATE 5,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .005 C.C.
1911	.....	4.30	90	19,000	15	2,700	11	—	—
	.....	4.30	cleaned	24,000	32	5,230	6.6		
May 17.....	9.50	.....	start						
	11.00	.....	91	22,000	117	1,600	18	0	+
	.....	2.00	92	25,000	300	3,200	74	+	+
17.....	.....	5.00	93	30,000	160	4,000	58	0	0
18.....	11.00	.....	94	27,000	225	2,200	41	0+	0
	.....	2.00	95	19,000	250	4,000	40	+0	—
19.....	10.00	.....	stop	24,600	210	3,000	46		
	schmutzdicke		plugged	tight over night					
	10,30	.....	96	28,500	60	4,800	18	0	0
	.....	1.30	97	26,500	38	7,300	10	0	+
	.....	5.00	98	.....	36	7,000	12	0	0
20.....	10.00	.....	99	150,000	35	38,000	20	—	0
	.....	1.00	100	100,000	43	35,000	16	0	0
				cleaned	between	1&2 p.m.			
22.....	.....	2.00	102	18,000	48	4,200	8	0	0
	.....	5.00	103	24,000	54	6,400	21	0	0
23.....	10.00	.....	104	31,400	40	7,900	6	0	0
	.....	1.00	start	54,057	44.2	13,825	13.8		
	.....	1.00	105	31,000	22	13,500	8	0	0
	.....	5.00	106	41,000	900	4,600	.....	+	+
				stop and	rested	till 25th	at 10.00		
25.....	10.00	.....	107	280,000	150	36,000	20	—	—
	.....	2.00	108	53,200	1,900	8,000	180	0	0
	.....	5.00	109	90,000	1,150	15,000	81	+	+
26.....	10.00	.....	stop	99,040	824.	15,420	72.2		
	10.00	.....	110	10,800	212	900	44	0	0
	.....	5.00	111	10,000	180	3,000	25	0	+
27.....	10.00	.....	112	15,500	105	2,200	7	0	0
	.....	12.00	113	20,000	96	7,300	17	0	0
29.....	10.00	.....	114	150,000	32	7,000	6	0	0
	12.30	.....	115	84,000	45	8,600	7	0	0
	.....	2.00	cleaned	48,383	111.6	4,833	17.6		
30.....	.....	2.00	start						
31.....	10.00	.....	116	13,400	1,330	2,400	480	0	0
	.....	1.30	117	120,000	2,600	10,700	480	0	+
31.....	.....	5.00	118	.....	1,000	.....	280	0	0
June 1.....	10.00	.....	stop	66,700	1,843	6,550	413.3		
	10.00	.....	119	60,000	280	9,600	96	0	0
	.....	1.00	120	50,000	570	9,700	110	0	0

Continued.

FILTERS.

GALLONS PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1. C.C.	5 C.C.	10 C.C.	.01 C.C.	.10 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
+	+	+	+	.....	.....	.....	0	0	—	+	.....	+	+
+	+	+	+	.....	.....	.....	0	—	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	—	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	—	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	—	—	+	.....	+	.....
+	+	.....	.....	.....	.....	.....	.....	0	+	+	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	+	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	+	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	+	+	.....	.....
0	0	.....	.....	.....	.....	.....	0	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
						.02 C.C.							
+	+	+	.....	.....	.....	.....	.....	+	+	+	.....	+	+
—	+	+	.....	.....	.....	0	+	+	+	+	.....	+	.....
+	+	+	.....	.....	.....	0	—	—	+	+	.....	+	.....
0	0	0	.....	.....	.....	0	+	+	+	+	.....	+	.....
+	—	.....	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	0	.....	.....	.....	.....	+	0	+	+	+	.....	+	.....
+	+	.....	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	.....	0	—	+	+	+	.....
—	+	.....	.....	.....	.....	0	0	0	+	+	+	+	.....
+	+	.....	.....	.....	.....	+	+	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	—	+	+	+	+	.....	.....	.....
0	0	.....	.....	.....	.....	0	+	+	+	+	.....	.....	.....
0	+	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	—	0	+	+	+	.....	.....	.....

APPENDIX B—

SAND

TANK "B"—RATE 5,000,000

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	4.00	121	22,000	312	10,300	82	0	0
June 2.....	10.00	.....	122	28,000	460	8,000	22	0	0
	.....	2.30	123	19,000	750	3,300	68	0	0
	.....	3.00	cleaned	35,800	4,544	8,380	75.6		
	.....	5.00	124	300	850	400	71	0	0
3.....	10.00	.....	125	45,000	630	6,000	60	0	0
	.....	1.00	126	38,000	260	5,800	40	0	0
5.....	.....	2.30	start	27,766	580	4,066	57		
	.....	2.30	127	92.000	270	15,400	11	0	0
	.....	3.15	128	.....	326	.....	77	.....	.....
	.....	3.25	129	.....	305	.....	80	.....	.....
	.....	3.35	130	.....	310	.....	—	.....	.....
	.....	3.45	131	.....	350	.....	103	.....	.....
	.....	3.55	132	136,000	380	21,000	65	0	0
	.....	5.00	133	.....	290	.....	35	.....	.....
6.....	11.00	.....	134	9,000	480	1,850	210	.....	.....
	.....	1.00	135	12,000	500	2,400	210	.....	.....
7.....	10.00	.....	136	1,500	230	90	60	.....	.....
	.....	1.30	137	2,400	175	2,400	38	.....	0
	.....	5.00	138	2,400	100	900	20	.....	.....
8.....	10.30	.....	stop	36,471	309.6	6,291	82.6		
	10.30	.....	139	3,000	95	120	10	.....	.....
	.....	1.00	140	270	65	36	34	.....	.....
		drained	through						
	.....	4.00	bottom	1,635	80	78	22	.....	.....
	.....	5.00	141	500	300	93	155	.....	.....
9.....	11.00	cleaned							
	.....	1.30	143	700	235	.....	27	.....	.....
10.....	10.00	.....	start	600	267.5	93	91		
	10.00	.....	144	1,296	80	15	12	.....	.....
	.....	1.00	145	1,160	50	2	14	.....	.....
	.....	1.00	stop	1,288	65	8.5	13		
11.....	10.30	.....	start						
12.....	10.30	.....	146	1,000	43	185	24	.....	.....
	.....	1.00	147	830	50	64	8	.....	.....
	.....	4.00	148	190	40	18	18	.....	.....
13.....	10.00	.....	149	400	33	17	4	.....	.....
	.....	12.00	150	280	30	18	3	.....	.....
	.....	4.00	151	112	28	7	17	.....	.....
14.....	11.00	.....	152	1,500	26	128	2	.....	.....
	.....	2.30	153	13,500	111	1,600	36	.....	.....
	.....	5.00	154	8,000	240	1,300	90	.....	.....
	.....	5.00	stop	2,866	66.7	370.7	22.4		
15.....	11.00	.....	155	15,000	100	4,600	60	—	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	2 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
+	+	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
—	—	.....	.....	.....	.....	—	+		+	+	.....	.....	.....
0	0	.....	.....	.....	.....	+	—	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	0	.....	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	.....	.....	.....	.....	.....	0	—	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	0	+	+	+	+	.....	.....	0	+	+	+	.....	+
.....	0	+	+	+	+	.....	0	+	+	+	.....	.....	.....
.....	.....	0	—	—	+	.....	0	0	—	+	+	.....	.....
+	+	+	.....	.....	.....	.....	0	—	+	+	+	.....	.....
.....	0	0	0	+	+	0	0	0	+	+	.....	.....	.....
.....	.....	0	+	+	+	.....	0	0	+	+	+	.....	.....
.....	.....	0	0	0	+	.....	.....	0	—	+	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	0	—	0	+	0	0	—	+	+	.....	+	+
.....	.....	.....	0	—	+	.....	0	—	+	+	+	.....	+
.....	.....	.....	0	0	0	.....	0	0	+	+	+	.....	+
.....	.....	.....	0	0	+	.....	.....	—	+	+	+	.....	+
.....	.....	.....	0	0	+	.....	.....	—	+	+	+	.....	.....
.....	.....	.....	0	0	0	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	0	—	+	.....	.....	+	+	+	+	.....	.....
.....	.....	.....	0	0	0	.....	.....	0	+	+	+	.....	.....
.....	.....	.....	0	—	+	.....	.....	—	—	+	+	.....	+
.....	.....	.....	0	0	0	.....	.....	0	0	+	+	.....	+
0	0	+	.....	+	+	.....	.....	0	+	+	+	.....	.....
0	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	0	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....

APPENDIX B—
SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
	.....	1.30	156	7,500	80	1,420	30	0	0
June 16.....	10.00	.....	157	12,000	51	580	18	.....	.....
	10.00	raked &	started	11,500	77	2,200	36		
	.....	5.00	158	13,500	67	2,200	12	.....	0
17.....	10.00	.....	159	3,000	27	300	.....	.....	.....
	12.00	.....	stop	8,250	47	1,250	12		
19.....	11.00	.....	start						
	11.00	.....	160	14,000	28	600	15	0	0
	.....	1.30	161	1,700	70	300	20	0	0
20.....	10.00	.....	162	12,000	300	4,500	110	.....	.....
	12.00	.....	163	9,000	230	12,000	160	0	0
	.....	3.30	164	25,000	800	7,500	240	0	0
21.....	10.30	.....	165	20,000	330	2,350	128	.....	.....
	10.00	.....	stop	13,616	293	4,541.6	112.1		
	.....	2.00	166	7,300	100	1,170	24	.....	.....
	.....	3.00	raked						
	.....	5.00	167	15,300	138	2,000	50	.....	.....
22.....	.....	.....	stopped						
23.....	11.00	.....	start						
24.....	11.00	.....	stop						
26.....	10.30	.....	start						
	10.30	.....	168	11,400	16	3,200	3	.....	0
	.....	2.00	169	18,000	610	6,000	315	.....	.....
	.....	4.30	170	11,500	355	3,800	120	.....	.....
27.....	10.00	.....	171	27,000	530	6,500	85	.....	.....
	.....	3.00	172	12,500	310	4,000	61	.....	.....
28.....	11.00	.....	173	18,000	130	8,500	44	.....	+
	11.00	.....	stop	16,400	325.1	5,333	104.6		
29.....	.....	2.00	raked						
30.....	10.00	.....	start						
	10.00	.....	175	120,000	116	6,000	11	+	+
	12.30	.....	176	88,000	1,100	3,100	142	+	+
				104,000	608	4,550	76.5		
	.....	4.00	stopover	holiday,	started	July 3rd,	12.00 wit	hout c	lean'g.
July 3.....	10.00	.....	177	90,000	46	650	2	0	0
	12.00	.....	178	300	47	5,000	11	0	0
	12.00	.....	start	45,150	46.5	2,825	6.5		
	.....	5.00	179	300	2,900	600	245	.....	.....
4.....	12.30	.....	180	7,300	1,100	1,000	134	.....	.....
	.....	4.00	181	1,200	760	600	76	.....	.....
5.....	10.00	.....	182	1,600	230	100	25	0	0
5.....	.....	1.00	183	1,300	220	150	11	0	0
	.....	5.00	184	7,600	330	3,500	38	0	0
6.....	10.00	.....	stop	3,216	923.3	991.6	88.1		
feed	pipe disc	onnected	while	repairing	apparat	us			
	.....	1.00	start						

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
0	0	++	.....	.....	.....	0	+	+	+	+	.....	.....	.....
0	0	++	.....	.....	.....	+	+	+	+	+	.....	.....	.....
0	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	0	+	+	.....	.....	.....
0	0	0	+	+	.....	0	+	+	+	+	.....	.....	.....
0	+	+	+	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	++	+	.....	.....	0	0	+	+	+	.....	.....	.....
—	+	++	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
—	+	++	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
0	+	+	.....	.....	.....	0	+	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	.....	.....	.....	.....	.....
0	+	++	.....	.....	.....	0	0	+	+	+	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	00	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	1.00	185	850	76	300	7	0	0
	.....	2.00	186	2,300	280	1,200	145	0	0
	.....	2.00	stop	1,575	178	750	76	.....	.....
July 7.....	10.00	.....	187	1,340	500	380	93	0	0
	.....	2.00	188	2,700	260	930	88	0	0
10.....	.....	1.00	189	8,100	10	1,840	5	0	0
11.....	10.00	.....	190	.....	.....	270	8	0	0
	.....	3.00	raked	4,046	256.6	855	48.5		

TANK "B"—RATE 10,000,000 GALLONS

12.....	10.00	.....	start						
	10.00	.....	191	1,200	3,000	25	300	.....	.....
	.....	1.00	192	300	540	5	107	.....	.....
	.....	5.00	193	70	460	7	37	.....	.....
13.....	10.00	.....	194	20	380	24	27	.....	.....
	.....	1.00	195	800	500	1,400	90	0	—
	.....	5.00	196	10,000	800	4,800	195	.....	—
14.....	10.30	.....	197	6,000	840	3,500	165	.....	.....
	12.00	.....	198	8,000	800	3,000	120	0	0
	12.00	.....	stop	3,298.7	1,540	1,595	130.1		
	.....	2.00	raked						
15.....	10.00	.....	start						
	10.00	.....	199	500	266	100	100	0	0
	.....	1.00	200	7,000	900	4,000	300	+	0
17.....	10.00	.....	201	200	315	11	104	.....	.....
	.....	1.00	202	6,000	220	300	68	.....	.....
	.....	5.00	203	700	200	113	63	.....	.....
	.....	5.00	stop	2,880	380.2	904.6	127		
18.....	.....	2.00	raked						
	.....	4.00	204	282	550	1	42	.....	.....
19.....	10.00	.....	205	1,300	240	370	35	.....	.....
	10.00	.....	start	791	395	186	38.5		
	12.00	.....	206	4,000	360	2,600	67	.....	+
	.....	5.00	207	6,400	300	3,000	173	0	0
20.....	10.00	.....	208	10,500	550	2,340	114	0	+
	.....	2.00	209	9,500	370	2,000	110	0	0
21.....	10.00	.....	210	7,500	120	1,700	57	0	0
	10.00	.....	stop	7,580	340	2,328	102.2		
	.....	3.00	raked						
24.....	10.00	.....	start						
	10.00	.....	211	6,700	85	1,500	16	0	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
0	0	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	0	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	—	+	+	.....	.....	.....
0	+	+	.....	.....	.....	0	0	+	+	+	.....	.....	.....

PER ACRE PER DAY.

0	0	0	—	—	+	—	+	+	.....	.....	.....	.....	.....
.....	0	0	—	+	+	0	+	+	+	.....	.....	.....	.....
0	0	0	.....	—	—	0	+	+	+	.....	.....	.....	.....
0	0	0	0	0	+	0	—	+	+	.....	.....	.....	.....
+	+	+	+	.....	.....	—	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	—	+	+	+	.....	.....	.....	.....
.....	.....	.....	+	+	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	+	.....	.....	0	+	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	—	—	+	.....	.....	.....	.....	.....
++	.....	.....	.....	.....	.....	—	+	+	.....	.....	.....	.....	.....
0	0	0	0	0	+	.....	0	+	+	.....	.....	.....	.....
0	0	0	+	+	+	+	+	+	+	.....	.....	.....	.....
.....	.....	0	+	+	+	0	0	+	+	+	.....	.....	.....
0	0	0	0	+	+	.....	+	+	+	+	.....	.....	.....
0	+	+	+	+	.....	.....	0	+	+	+	.....	.....	.....
+	+	+	.....	.....	.....	.....	+	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	—	+	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "B"—RATE 10,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	1.00	212	24,000	210	7,600	60	+	.....
	.....	5.00	213	7,000	450	5,000	165	0	.....
July 25.....	10.00	.....	214	22,400	440	9,300	240	+	+
	.....	11.30	stop	15,025	296.2	5,850	115.2		
			repairing appara		tus.	filter not	cleaned.		
	.....	1.00	215	17,000	440	7,300	170	—	+
	.....	3.00	start						
	.....	5.00	216	10,000	650	2,300	230	0	0
26.....	10.00	.....	217	.....	120	.....	51	—	+
	10.00	.....	stop	10,000	385	2,300	140.5		
	11.00	.....	raked						
27.....	10.00	.....	start						
	10.00	.....	218	46,600	135	30,000	22	+	0
	10.10	.....	219	.....	.....	.....	40	.....	.....
	10.20	.....	220	.....	.....	.....	77	.....	.....
	10.30	.....	221	.....	.....	.....	100	.....	.....
	10.40	.....	222	.....	.....	.....	110	.....	.....
	10.50	.....	223	.....	.....	.....	530	.....	.....
	11.00	.....	224	.....	.....	.....	900	.....	.....
	11.30	.....	225	.....	.....	.....	625	.....	.....
	12.00	.....	226	.....	1,200	.....	220	0	+
	12.30	.....	227	.....	.....	.....	165	.....	.....
	.....	1.00	228	4,400	.....	26,000	185	.....	.....
	.....	1.30	229	.....	.....	.....	200	.....	.....
	.....	2.00	230	.....	.....	.....	137	.....	.....
	.....	3.00	231	.....	.....	.....	136	.....	.....
	.....	4.00	232	.....	.....	.....	110	.....	.....
	.....	5.00	233	28,000	420	12,000	118	0	0
28.....	10.00	.....	234	4,700	300	1,800	95	0	0
	.....	1.00	235	4,555	380	1,800	60	0	0
	.....	6.00	236	3,500	250	1,600	54	0	0
29.....	10.00	.....	237	3,300	193	800	70	0	0
	.....	5.30	238	2,200	150	300	28	0	0
	.....	5.30	stop	17,100	378.5	9,287.	189.6		
31.....	2.00-4.00	.....	raked						
Aug. 1.....	10.00	.....	start						
	•10.00	.....	239	9,000	3,200	1,500	320	.....	.....
	.....	1.00	240	19,000	400	3,300	84	0	0
2.....	10.30	.....	241	17,000	340	3,860	115	0	0
	.....	1.00	242	12,000	460	2,080	110	—	—
	.....	5.00	243	12,000	230	3,200	51	.....	0
3.....	10.00	.....	244	24,000	145	4,700	40	0	+
	10,00	.....	stop	15,500	786	3,106	120		
10.....	.....	4.00	raked						
11.....	10.00	.....	start	12,000	8,000	2,000	2,000	.....	0
		Temp. of	water	Aug. 3rd	-11th 20° C				

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
+	+	.....	.....	.....	.....	—	+	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	—	+	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	0	.....	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	0	+	+	.....	.....	.....	— +	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	.....	0 +	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	00	+	+	.....	.....	.....	.....
+	0	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	.....	+	+	+	.....	.....	.....	.....

APPENDIX B—
SAND

EXPERIMENTAL STATION. TANK "C"—RATE 5,000,000 GALLONS

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911 Mar. 2.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6.....	12.00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....
7.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....
8.....	12.00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....
10.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	4.00	.....	.....	.....	.....	.....	.....	.....
11.....	12.00	.....	.....	.....	.....	.....	.....	.....	.....
13.....	12.00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....
14.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	12.00	.....	.....	.....	.....	.....	.....	.....
.....	.....	5.00	.....	.....	.....	.....	.....	.....	.....
The Sand was la	Charact id witho	er of effl ut wash	uent bef ing so th	ore the at neces	sewage sitated	influent determ	was app inations	lied. as giv	en.
14.....	.....	4.00	.....	.....	18	.....	18	.....	.....
16.....	10.00	.....	.....	.....	.....	.....	43	.....	.....
.....	.....	1.00	1	.....	.....	.....	22	.....	.....
24.....	.....	5.00	stop	.....	18	.....	27		
25.....	11.00	.....	first cle	aning af	ter filling	g filter	with an	unwas	hed pit
	12.45	.....	started						
.....	.....	1.00	2	14,000	.....	2,320	4,200	.....	.....
27.....	.....	5.00	3	880	.....	.....	3,530	0	0
28.....	10.00	.....	4	16,000	3,000	45	1,200	0	0
								.001 C.C.	.01 C.C.
.....	.....	5.00	5	740 7,000	0 6,400	320 2,600	0 600		+0
29.....	10.00	.....	6	243	0 2,500	30	4 20	.....	.....
.....	.....	5.00	7	3,200 30,000	0 2,800	340 3,600	2 22	.....	+
30.....	10.00	.....	8	260	0 1,800	35	—	.....	.....
.....	.....	5.00	9	600 8,000	0 1,700	1,120 5,600	160 500	.....	+
31.....	10.00	.....	10	9,000	13,600	280 2,000	3 136	.....	
.....	.....	5.00	11	1,300 8,500	5,400	1,300 3,850	34 280	0	0
April 1.....	10.00	.....	12	7,800	7,500	3,950	8 480	0	
4.....	.....	5.00	13	900 13,300	350	1,300 4,500	11 40	00	+ +
5.....	10.00	.....	14	8,800	420	2,600	11 24	0+	— —

Small figures Red Colonies on Litmus Lactose Agar.

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
											D —		
.....	.....	.....	.....	.....	.....	0	0	0	0	.....		.....	0
.....	.....	.....	.....	.....	.....	.....	.....	+0	.....	.....	0—	.....	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	— 00
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....	000	.....	000
.....	.....	.....	.....	.....	.....	.....	00	00	.....	.....	00	.....	000
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....	000	.....	000
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....	000	.....	000
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	00—	.....	00—
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0000
.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	00	.....	00
.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	00	.....	00
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....	00	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....	00	.....	00
.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	00	.....	00
											D —		
.....	.....	.....	.....	.....	.....	0	0	0	0	.....	60	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	00	.....	.....		.....	000
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
sand,	surfac	e level	led.										
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	+	+	+	+	.....	.....	+	.....	
0	.....	.....	0	.....		—	+		.....	.....		.....	
.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	30 C.C.	50 C.C.	.01 C.C.	.1 C.C.	1. C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
+	+	+	.....	.....	.....	0	0		+		.....	+	.....
.....	0	0	.....	0	0	0	0		.....		.....	.....	.....
+		.....	+	+	.....	0	0	—			.....		.....
.....	0	0	0			00				.....	.....	+	.....
++	+			.....	.....	0				.....	.....	.....	.....
+	+	+	+	.....	.....	.....		+	+		.....	.....	.....
+	+	.....	.....	.....	.....	.....	++	+			.....	.....	.....
+		.....	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
							G — —		+		.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0+			+	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .01 C.C.
1911	.....	5.00	15	3,000 19,200	190	1,800 7,000	9 27	+	—+
April 6.....	10.00	.....	16	600 7,200	80	2,600	4 26	—	+
7.....	10.20	.....	17	600 5,100	5 141	800 3,500	6 30	0	—+
	.....	5.00	18	14,100	500	1,800	10 55	0	—0
	.....	5.00	stop	9,950	2,960	2,875	695		
8	.....	1.00	19	7,000	1,100	2,000	27	0	+ -
11.....	11.00	.....	20	28,000	3,000	800 3,700	0 61	+	++
	.....	12.00	21	.....	3,300	.....	70		
	.....	1.00	22	.....	1,520	.....	114		
	.....	2.00	23	.....	900	.....	75		
11.....	.....	3.00	23	.....	181	.....	73	.....	.....
	.....	4.00	23	.....	920	.....	242	.....	.....
	.....	5.00	23	29,000	3,200	2200 6,200	18 42	.....	.....
12.....	11.00	.....	24	3,400 18,000	1,200	800 3,900	9	.....	.....
								.001 C.C.	.01 C.C.
13.....	.....	5.00	26	11,400	135	3,500	11	0	—0
15.....	10.00	.....	27	19,000	270	4,700	29	00	0+
	.....	1.00	stop	18,730	1,430	4,000	68		
	.....	1.00	28	8,800	87	4,400	23	00	0+
17.....	10.00	.....	29	.....	113	3,000	7	0+	+-
	.....	1.00	30	40,000	64	7,300	8	00	+0
	.....	5.00	31	10,400	45	1,900	9	00	+-
18.....	10.00	.....	32	16,500	43	2,800	.....	00	+-
	.....	1.00	33	14,000	77	3,400	10	0	+-
	.....	3.00 after cleaning	start	17,940	71	3,800	11		
	.....	5.00	34	5.000	60	2,300	24	0	00
19.....	10.00	.....	35	32,700	2,700	5,900	18	.....	0+
	.....	1.00	36	26,400	530	8,400	22	0	0+
	.....	5.00	37	15,300	251	9,000	25	00	0-
								.001 C.C.	.005 C.C.
20.....	10.30	.....	38	30,000	187	8,200	19	.....	0
	.....	5.00	39	8,200	170	2,400	23	0	0
21.....	10.00	.....	40	2,600	180	170	13	0	.....
	.....	2.00	41	10,200	150	1,000	16	00	0
	.....	5.00	42	13,800	76	2,000	11	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
—	.....	.....	.....	.....	.....	.....	00	—	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	00	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
0	+	+	.....	.....	.....	0	— —	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	—	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.1 C.C.	0.1 C.C.	5 C.C.	10 C.C.	30 C.C.	50 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	+	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	G —	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	G —	+	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	+	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	G —	+	.....	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	+	.....	.....	+	+
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.								
++	.....	.....	.....	.....	.....	.....	.....	+	+	.....	.....	+	+
—	.....	.....	.....	.....	.....	.....	.....	.....	+	+	.....	+	.....
0—	+	.....	.....	.....	.....	.....	0	0	+	+	+	.....	.....
0—	+	.....	.....	.....	.....	.....	0	+	+	+	+	+	.....
0	+	.....	.....	.....	.....	.....	0	0	0	0+	0+	+	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
April 22.....	10.00	.....	43	8,200	53	2,300	18		—
.....		2.30	44	6,100	50	5,100	15	0	0
24.....	10.00	.....	stop	14,410	401	4,252	18.5		
	10.00	.....	45	2,400	34	440	11		
.....		2.30	46	2,400	32	180	2		
.....		5.00	47	580	170	74	14		
25.....	10.00	.....	48	500	45	36	16		
								.001 C.C.	.005 C.C.
.....		1.00	49	.....	88	.....	6		
26.....	10.00	.....	start	1,470	74	182	9.8		
	cleaned	25th at	1.00						
	10.00	.....	50	100	46	30	4		
.....		11.30	51	100	73	30	30		
.....		5.00	52	.....	67	.....	12		
27.....	10.00	.....	53	.....	100	.....	23		
.....		1.30	54	.....	58	.....	11		
.....		5.00	55	.....	71	.....	16		
28.....	10.00	.....	head in	orifice	Box 4 in.				
	10.00	.....	56	.....	200	.....	15		
.....		2.00	57	.....	113	.....	9		
.....		5.00	58	3,000	290	400	13	0	0
29.....	10.30	.....	59	12,000	100	4,000	13	0	0
.....		2.30	60	7,600	45	1,500	23	0	0
May 1.....	10.00	.....	stop	4,560	105.7	1,192	15.3		
	10.00	.....	61	2.700	36	1,400	.8		
.....		1.00	cleaned	usually	filled fro	m top			
.....		2.00	62	.....	85	.....	24	0	
.....		4.00	63	6,000	20	4,400	6		
2.....	10.30	.....	64	6,400	50	3,700	6		
3.....	11.50	.....	start	5,030	48	3,160	11		
	11.55	.....	68	4,000	30	1,330	7		
	12.20	.....	69	.....	100	.....	25		
	12.35	.....	70	3,070	108	1,250	38		
	12.45	.....	71	.....	100	.....	20		
	12.55	.....	72	.....	105	.....	.....		
.....		1.10	73	.....	81	.....	36		
.....		2.10	74	3,400	340	1,420	24		
.....		3.10	75	1,400	200	.....	36		
3.....	.....	4.10	76	.....	.....	.....	35		
.....		5.10	77	1,400	125	.....	29	.....	0
4.....	12.00	.....	78	550	130	90	8	.....	0
	.....	2.30	79	.....	.....	.....	.....	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0+	+	.....	.....	.....	.....	.....	.....	0	+	+	+	+	
++	+	.....	.....	.....	.....	.....	0	0		+	+	+	
.....	.....	0	—			.....	0				.....		
.....	.....	0	+	+	+	.....	.....	0	0	+	.....	+	
.....	.....	0	0	0		.....	.....	0	0		.....		+
.....	.....	0	00	0	0	.....	.....	0	0	+	0		
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C	50 C.C.
.....	0	00	0	0	0	.....	.....	0	0		0	+	
.....	0	0	0	0	0	.....	.....	.....	.....	0	0		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+	+		
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	G —	.....	+	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....				+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		D —		
.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0			
.....	.....	.....	.....	.....	.....	.....	.....	0		0	0	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	0			+	+
00	0	+	+	+		.....	.....	0	0	0	.....	+	
00	+		+	.....	.....	.....	0	G —	0	0	.....		
—0	+		+	.....	.....	.....	0	0	0		.....	+	
0	+	.....	.....	+		.....	0	0	0		.....	+	
+	+	+	+	.....	.....	.....	.....	0	—	0	+		+
+	.....	+	.....	.....	.....	.....	.....	0	0	0	.....	+	0
.....	.....	.....	.....	.....	.....	.....	.....	0	0	0	.....	0	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	0
.....	—	+	+	+	.....	.....	.....	.....	.....	0	.....	0	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	G —	.....	+	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	+	+
.....	0	0	+		.....	.....	.....	.....	.....		.....	+	
.....	.....	.....	.....	.....	.....	.....	.....	.....	—		.....	+	+
.....	0	0	+			.....	.....	.....	+	+	.....	+	+
.....	.....	.....	.....	.....	.....	.....	.....	0	+	+	.....		
.....	.....	.....	.....	.....	.....	.....	.....	0	+		.....	+	
0	0	0	+	.....	.....	.....	.....	0	+		.....	+	+
0	0	0	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .005 C.C.
1911									
	.....	5.00	80	800	235	80	14	.....	0
May 5.....	12.30	.....	81	209	200	6	8	.....	.....
	.....	5.00	82	200	200	.....	8	.....	.....
6.....	10.00	.....	83	1,260	90	.....	8	.....	.....
	.....	12.00	84	1,100	130	13	7		
8.....	10.00	.....	stop	1,580	145	598	20		
	10.00	.....	85	.....	14	.....	2	.....	.....
	.....	1.00	86	.....	10	.....	9	.....	.....
	.....	5.00	87	.....	44	.....	2	.....	.....
9.....	10.00	.....	88	14,300	21	1,620	13	.....	0
	.....	2.30	89	13,700	15	2,100	10	.....	0
	.....	5.00	90	14,700	62	2,050	4	0	0
10.....	12.00	.....	91	4,900	90	550	.....	0	0
	.....	5.00	92	27,000	55	14,000	.....	0	0
11.....	10.00	.....	93	13,000	70	3,400	10	0	+
	.....	2.30	94	17,300	47	2,430	6	0	+
	.....	3.00	cleaned	14,985	43	3,735	7		
	.....	5.00	95	17,700	37	6,600	18	0	+
12.....	9.00	.....	start						
	11.00	.....	96	26,000	.....	4,300	11	—	0
	.....	5.00	97	110,000	6,000	22.000	150	0	0
13.....	10.30	.....	98	39,000	3,800	7,100	300	+	+
	.....	2.30	99	14,400	4,000	5,200	.....	0	0
15.....	9.00	.....	stop	41,420	3,460	9,040	119		
16.....	10.00	.....	100	28,000	30	7,000	13	0	0
16.....	.....	2.30	101	25,000	53	6,000	4	0	0
	.....	4.30	102	19,000	100	2,700	24	—	—
17.....	9.00	.....	start	24,000	61	5,230	13.6		
	11.00	.....	103	22,000	500	1,600	100	0	+
	.....	2.30	104	25,000	200	3,200	46	+	+
	.....	5.00	105	30,000	142	4,000	42	0	0
18.....	11.00	.....	106	27,000	164	2,200	28	0+	0
	.....	2.00	107	19,000	340	4,000	35	+0	—
19.....	10.00	.....	108	28,500	72	4,800	30	0	0
	10.00	.....	stop	25,250	236	3,300	47		
	.....	1.30	109	26,500	93	7,300	20	0	+
	.....	5.00	110	.....	100	7,000	11	0	0
20.....	10.00	.....	111	150,000	52	38,000	28	—	0
	.....	1.00	112	100,000	48	35,000	17	0	0
22.....	.....	1.00	cleaned	92,166	50.7	21,825	19		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0	0	0	+	.....	.....	.....	.....	+	+	+	.....	+	+
.....	0	0	0	0	0	.....	.....	0	+	+	.....	+	+
.....	.....	0	0	0	0	.....	.....	0	+	+	.....	+	+
.....	.....	.....	.....	0	0	.....	.....	—	+	+	.....	+	+
.....	.....	.....	0	0	+	.....	.....	0	—	+	.....	+	+
.....	.....	.....	0	0	0	.....	.....	0	+	+	.....	+	+
.....	.....	.....	0	0	0	.....	.....	0	0	+	.....	+	+
.....	.....	.....	—	+	+	.....	.....	.....	0	+	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	+	0	.....	0	+
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	0	—
+	—	+	+	.....	.....	.....	.....	—	+	+	.....	+	+
0	0	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	0	—	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	0	0	.....	+	+
+	+	+	+	.....	.....	.....	.....	0	0	+	.....	+	+
+	+	+	+	.....	.....	0	0	+	+	+	.....	+	.....
0	0	+	+	.....	.....	.....	—	+	+	+	.....	+	+
0	+	+	+	.....	.....	.....	.....	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	0	0	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	0	+	+	+	+	.....	+	+
+	+	+	+	.....	.....	.....	+	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	+	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	+	+
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	+	.....
+	+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	+	+	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	2.00	113	18,000	50	4,200	6	0	0
	.....	5.00	114	24,000	40	6,400	10	0	0
May 23.....	10.00	.....	115	31,400	67	7,900	10	0	0
	.....	1.00	start	24.466	52.3	6,166	8.6		
	.....	1.00	116	31,000	36	13,500	.....	0	0
	.....	5.00	117	41,000	139	4,600	30	+	+
	.....	5.00	stop	36,000	87.5	9.033	30		
	stopped	over holi	day abo	ut 39 ho	urs not	cleaned			
25.....	10.00	.....	start						
	10.00	.....	118	280,000	46	36,000	8	—	—
	.....	2.00	119	53,200	550	8,000	40	0	0
	.....	5.00	120	90,000	270	15,000	32	+	+
26.....	10.00	.....	stop	141,066	288.6	19,333	26.6		
	10.00	.....	121	10,800	280	900	42	0	0
	.....	5.00	122	10,000	121	3,000	15	0	0
								.001 C.C.	.002 C.C.
27.....	10.00	.....	123	15,500	90	2,200	11	0	0
	11.00	.....	cleaned	12,100	163.6	2,033	22.6		
	12.00	.....	124	20,000	130	7,300	28	0	0
29.....	12.00	.....	125	84,000	54	8,600	7	0	0
30.....	.....	2.00	start	52,000	92	7,950	17.5		
31.....	10.00	.....	126	13,400	220	2,400	31	0	0
	.....	1.00	127	120,000	380	10,700	44	0	+
	.....	5.00	128	—	120	—	54	0	0
June 1.....	10.00	.....	129	60,000	380	9,600	87	0	0
	.....	1.00	130	50,000	400	9,700	57	0	0
	.....	1.30	stop	60,850	300	8,100	50.6		
	.....	5.00	131	22,000	250	10,300	41	0	0
2.....	10.00	.....	132	28,000	220	8,000	20	0	0
	.....	2.00	133	19,000	175	3,300	18	0	0
	.....	2.30	cleaned	23,000	215	7,200	26.3		
	.....	5.00	134	300	225	400	20	0	0
3.....	10.00	.....	135	45,000	180	6,000	30	0	0
	.....	1.00	136	38,000	135	5,800	24	0	0
5.....	.....	2.30	start	27,766	180	4,066	24.6		
	.....	2.30	137	92,000	41	15,400	9	0	0
	.....	3.15	138	.....	230	.....	76		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0	0	0	0	.....	.....	.02 / 0	0	—	+			+	
+	+	.....	.....	.....	.....	.....	0	0	+			+	
+	+	.....	.....	.....	.....	.....	.....	0	+		.....	+	
+	+	.....	.....	.....	.....	.....	.....	0	—			+	
	+	.....	.....	.....	.....	0	0		+	+	.....	+	
+	+		.....	.....	.....	.....	.....	0			.....	+	
—			.....	.....	.....	—	—				.....	.....	.....
+		+	.....	.....	.....	—	—		+		.....	+	.....
0	0	0	.....	.....	.....	0					.....	.....	.....
+	—	.....	.....	.....	.....	0	0	—			.....	+	.....
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
+	0	.....	.....	.....	.....	0	0		+			.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	+		.....	.....
—	—	.....	.....	.....	.....	0	0	0	—	—		.....	.....
+		.....	.....	.....	.....	.....	0				+	.....	.....
+	+	.....	.....	.....	.....	.....	—		+	+		.....	.....
0	0	.....	.....	.....	.....	.....	0				+	.....	.....
0	+	.....	.....	.....	.....	.....	0		+	+	+	.....	.....
		.....	.....	.....	.....	.....	+		+	+		.....	.....
+	+	.....	.....	.....	.....	.....	00			+		.....	.....
+	+	.....	.....	.....	.....	.....	0		+			.....	.....
—	—	.....	.....	.....	.....	.....	0					.....	.....
0	0	.....	.....	.....	.....	.....	0				.....	.....	.....
+		.....	.....	.....	.....	.....	0	—				.....	.....
	0	.....	.....	.....	.....	.....	0	—			.....	.....	.....
		.....	.....	.....	.....	.....	0	0			.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000, GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	3.25	139	.....	222	.....	84		
	.....	3.45	140	.....	225	.....	92		
	.....	3.45	141	.....	155	.....	86		
	.....	3.55	142	136,000	230	21,000	50	0	0
	.....	5.00	143	.....	430	.....	74		
June 6.....	11.00	.....	144	9,000	470	1,850	127		
	.....	1.00	145	12,000	460	2,400	160		
7.....	10.00	.....	146	1,500	150	90	37		
	.....	1.30	147	2,400	160	2,400	34		
	.....	5.00	148	2,400	106	900	40		
8.....	10.30	.....	stop	36,471	239.9	6291	72.4		
	10.30	.....	149	3,000	73	120	12		
	.....	1.00	150	270	90	36	43		
	.....	5.30	151	500	138	93	30		
9.....	12.00	.....	cleaned	1,256	100.3	83	28.3		
	.....	1.30	152	700	218	.....	13		
10.....	10.00	.....	start						
	10.00	.....	153	1,296	190	15	30		
	.....	1.00	154	1,160	70	2	21		
	.....	1.00	stop	1,228	130	8.5	25.5		
11.....	10.30		start						
12.....	10.30	.....	155	1,000	86	185	13		
	.....	1.00	156	830	60	64	6		
	.....	4.00	157	190	44	18	7		
13.....	10.00	.....	158	400	37	17	10		
	.....	12.00	159	280	40	18	10		
	.....	4.00	160	112	25	7	18		
14.....	11.00	.....	161	1,500	60	128	4		
	.....	2.30	162	13,500	40	1,600	18		
	.....	5.00	163	8,000	70	1,300	31		
15.....	11.00	.....	164	15,000	145	4,600	65	—	0
	.....	1.00	165	12,500	130	3,500	50	0	0
	.....	4.00	166	7,500	144	1,420	36	0	0
16.....	10.00	.....	167	12,000	82	580	34		
	.....	1.00	168	5,700	116	900	20	0	
	.....	5.00	169	13,500	97	2,200	18		
17.....	10.00	.....	170	3,000	72	300	16		
17.....	12.00	.....	stop	6,563	90.5	1,052	22.2		
19.....	11.00	.....	start						
	11.00	.....	171	14,000	30	600	11	0	0
	.....	1.30	172	1,700	117	300	22	0	0
	.....	1.30	stop	7,850	73.5	450	16.5		
20.....	10.00	.....	173	12,000	422	4,500	26	0	0
	12.00	.....	174	9,000	80	12,000	26	0	0
	.....	3.30	175	25,000	340	7,500	—	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.01 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	25 C.C.	50 C.C.
0							0						
	0							0	+				
	0						0						
		0	—	—			0	0	+	—	+		
0+	+						0	+					
	0	0	0				0	0	+				
		0	+				0		+	+			
		0	0	0	+		0	—					
		0	—	0			0	0					
			0	—			0					+	
			0	0	0		0	—	+	+		+	
			0	0				0	+				
			0	0	+								
			0	—				0					
			0	0	0			0					
			0	—	+			0					
			0	0	0			0					
	0	+		+			0	0	+	+			
0	+	+					0	+	+	+			
0	0	0					0+	+	+	+			
+	+	0					0	+	+	+			
0	0	+					0	—	+				
0	0	+					0	—	+	+			
0	0	+					0—	+	+	+			
0	0						0			+			
0	0	+					0	—		+			
0	0	+	+				0	+	+				
0	0						0	0					
0	0	0	+				0	+	+	+			
0	+	+	+				0	+	+				
+	+	+	+				0	0	+				
+	+	+	+				0	0	+	+			

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
June 21	10.30	.....	176	20,000	200	2,350	0		
	.....	2.00	177	7,300	190	1,170	—		
	.....	4.00	raked	14,660	246.4	6,304	13		
	.....	over and 5.00	started 178	15,300	60	2,000	15		
22	.....	.....	stopped						
23	11.00	.....	start						
24	11.00	.....	stop						
26	10.30	.....	start						
	10.30	.....	179	11,400	14	3,200	2		0
	.....	2.00	180	18,000	145	6,000	36		
	.....	4.30	181	11,500	70	3,800	30		
27	10.00	.....	182	27,000	100	6,500	20		
	.....	3.00	183	12,500	100	4,000	12		
28	11.00	.....	184	18,000	230	8,500	180		+
	12.00	.....	185	22,600	420	9,300	145		0
	12.15	.....	186	31,000	310	8,500	96		
	12.45	.....	187	29,000	290	24,000	150		
	.....	1.00	188	—	310	11,200	88		
	.....	1.45	189	34,000	340	19,000	82		
	.....	2.00	190	30,000	300	18,500	54		0
28	.....	2.00	stop	20,416	219.0	10,208	74.5		
29	10.30	.....	start						
	10.30	.....	191	300,000	160	6,000	25	+	+
	.....	2.30	192	200,000	1,350	7,000	50		+
	.....	3.30	193	300,000	1,430	5,100	50	+	+
30	10.00	.....	stop	266,666	980	6,033	41.6		
	10.00	.....	194	120,000	620	6,000	38	+	+
	.....	12.30	195	88,000	710	3,100	16	+	+
July 3	10.00	.....	196	90,000	78	650	5	0	0
	12.00	.....	197	300	53	5,000	3	0	0
	.....	4.00	raked	74,575	365.2	3,687.5	15.5		
	.....	5.00	198	300	1,300	600	54		
4	10.00	.....	start						
	12.30	.....	199	7,300	520	1,000	36		
	.....	4.00	200	1,200	100	600	19		
5	10.00	.....	201	1,600	135	100	10	0	0
	.....	1.00	202	1,300	85	150	6	0	0
	.....	5.00	203	7,600	70	3,500	11	0	0
6	10.00	.....	stop	3,800	182	1.070	16.4		
	.....	1.00	start						
	.....	1.00	204	850	76	300	17	0	0
	.....	2.00	205	2,300	200	1,200	42	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
0			+	+	.....	.....	0	—	+		.....	.....	.....
—	+	+	.....	.....	.....	.....	0	0	+	+	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+		.....	.....	.....	.....	0+		+		.....	.....	.....
—	+	+	.....	.....	.....	.....	+	+	+	+	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	+		.....	.....	.....
0	+	.....	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
		.....	.....	.....	.....	.....					.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
						.05 C.C.							
+	+	+	.....	.....	.....	+	+		+		.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	0	.....	.....	.....	.....	0	+		+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0		+	+	.....	.....	.....	.....
+		.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	0	0		+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	0	0	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	0	0	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+		.....	.....	.....	.....
0	+	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	0	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	0	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1911									
	.....	5.00	206	2,400	107	100	20	0	0
July 7.....	10.00	.....	207	1,340	76	380	18	0	0
	.....	2.00	208	2,700	51	930	23	0	0
	.....	5.00	stop	1,918	102	582	24		
10.....	.....	1.00	209	8,100	12	1,840	6	0	0
11.....	10.00	.....	210	.....	—	270	.....	0	0
	.....	12.00	211	1,740	56	300	56	0	0
	.....	4.00	212	.....	—	150	26		
12.....	10.00	.....	start	4,920	34	640	24.7	.....	.....
	10.00	.....	2.13	1,200	.....	25	30	.....	.....
		1.00	2.14	300	234	5	30	.....	.....
		5.00	2.15	70	55	7	12	.....	.....
13.....	10.00	2.16	.....	20	40	24	11	.....	.....
		1.00	2.17	800	45	1,400	1	0	—
		1.00	stop	478	93.5	292.2	16.8		

TANK "C"—RATE, 10,000,000 GALLONS

14.....	10.30	.....	start	.....	.....	.....	.....	.....	.....
	10.30	.....	2.18	6,000	176	3,500	26	.....	.....
	12.00	.....	2.19	8,000	75	3,000	16	0	0
	.....	5.00	2 20	2,400	120	1,400	84	.....	.....
15.....	10.00	.....	2.21	500	68	100	72	0	0
	10.00	.....	stop	4,225	109.7	2,000	49.5	.....	.....
17.....	10.00	.....	2.22	200	56	11	6	.....	.....
		5.00	2.23	700	.....	113	.....	.....	.....
18.....	10.20	.....	start	450	56	62	6	.....	.....
		cleaned	before	hand ?					
	10.20	.....	2.24	40	300	4	9	.....	.....
	10.35	15	2.25	.....	.....	.....	16	.....	.....
	10.55	35	2.26	.....	.....	.....	102	.....	.....
	11.15	55	2.27	.....	.....	.....	34	.....	.....
	11.45	85	2.28	.....	.....	.....	12	.....	.....
	12.00	1.00	2.29	.....	27	.....	5	.....	.....
	12.45	1.45	2.30	.....	.....	.....	5	.....	.....
	1.60	1.00	2.31	20	.....	3	6	.....	.....
	.....	1.30	2.32	.....	.....	.....	4	.....	.....
	.....	2.00	2.33	.....	.....	.....	1	.....	.....
	.....	3.00	2.34	.....	.....	.....	4	.....	.....
	.....	4.00	2.35	.....	44	.....	8	.....	.....
	.....	5.00	2.36	282	40	1	7	.....	.....
18.....	.....	5.00	stop	114	102.7	2.6	16.1	.....	.....

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1.0 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	·	+		.....	.....	.....
+	+	.....	.....	.....	.....	0	0	+	·	·	.....	.....	.....
+	+	.....	.....	.....	.....	0	0	0	·	–	.....	.....	.....
0	+	.....	+	·	.....	0	0	+	+	—	.....	.....	.....
+	0	.....	+	·	.....	.....	.....	.....	.....	.....	.....	.....	.....
—0	.....	+	+	·	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	—	—	+	.....	0	+	·	.....	.....	.....	.....
.....	0	0	—	·		.....	0—	·	+	.....	.....	.....	.....
0	0	0	.....	—	—	.....	0	—	—	.....	.....	.....	.....
0	0	0	0	0	·	.....	0	0	–	.....	.....	.....	.....
+	+	+	+	.....	.....	0	—	—	—	·	.....	.....	.....

PER ACRE PER DAY.

.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	+	+	·	0	+	·	.....	.....	.....	.....	.....
+	+	+	+	.....	.....	0	+	+	.....	.....	.....	.....	.....
0	+	+	+	.....	.....	0		+	·	.....	.....	.....	.....
.....	0	0	.....	.....	.....	0	—	+	.....	.....	.....	.....	.....
0	0	0	0	0		0	+	·	+	.....	.....	.....	.....
.....	.....	0	–	·		0	0	·	·	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	0	0	0	.....	—0	·	·	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	0	+	·	.....	0	0	·	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	0	·	·	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
1 11									
July 19.....	10.00	.....	start					.....	.....
	10.00	.....	237	1,300	103	370	5	.....	+
	12.00	.....	238	4,000	60	2,600	12	0	0
	.....	5.00	239	6,400	45	3,000	17	0	+
20.....	10.00	.....	240	10,500	50	2,340	13	0	0
	.....	2.00	241	9,500	42	2,000	7	0	.....
21.....	10.00	.....	242	7,500	29	1,700	4	0	.....
22.....	12.00	.....	243	900	44	500	23		
	.....	1.00	244	13,500	35	7,100	15	0	.....
24.....	10.00	.....	245	6,700	31	1,500	14		
	10.00	.....	stop	6,600	48.7	2,345	12.2	.....	.....
	.....	2.00	raked						
25.....	10.00	.....	start					+	+
	10.00	.....	246	22,400	240	9,300	105		
	10.10	.....	247	.....	.....	.....	105		
	10.20	.....	248	.....	.....	.....	70		
	10.35	.....	249	.....	.....	.....	194		
	11.30	.....	250	.....	.....	.....	102		
	11.30	.....	stopped	apparatus					
	.....	3.00	start						
	.....	3.00	251	.....	170	.....	97	0	0
	.....	5.00	252	10,000	200	2,300	14	—	+
26.....	10.00	.....	253	46,600	50	30,000	22	—	0
	.....	1.00	254	44,000	65	26,000	—	+	+
	.....	5.00	255	28,000	66	12,000	25	+	0
27.....	10.00	.....	256	13,000	100	4,000	40	0	+
	12.00	.....	257	9,700	125	2,700	32	0	0
	.....	5.00	258	7,000	85	900	20	0	0
28.....	10.00	.....	259	4,700	110	1,800	22	0	0
	.....	1.00	260	4,500	98	1,800	15	0	0
	.....	6.00	261	3,500	70	1,600	28	0	0
29.....	10.00	.....	262	3,300	64	800	24	0	0
	.....	5.00	263	2,200	56	300	15	0	0
31.....	10.00	.....	264	1,300	47	800	14		
	10.00	.....	stop	12,729	102.4	6,735.	52.6		
	.....	2.00	raked						
Aug. 1.....	10.00	.....	start						
	10.00	.....	265	9,000	144	1,500	20	0	0
	.....	1.00	266	19,000	60	3,300	21	0	0
2.....	10.30	.....	267	17,000	52	3,860	22	—	—
	.....	1.00	268	12,000	67	2,080	21	.....	0
	.....	5.00	269	12,000	57	3,200	20	0	+
3.....	10.00	.....	270	24,000	57	4,700	26	0	0
	.....	2.00	271	21,000	60	4,000	15	0	0
	.....	6.00	272	67,000	66	4,700	15	0	+
4.....	11.00	.....	273	72,000	42	—	12	0	0
	.....	1.00	274	42,000	46	2,200	11	0	0
	.....	4.30	275	17,000	43	3,000	21		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
0	+	+	+	+		.....	0	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....
+	+	+	+	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	0+	+	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	+	.....	.....	.....	.....	.....	0	+	.....	.....	.....	.....	.....
						.05 C.C.							
+	+	.....	.....	.....	.....	0	—	+		.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	0	.....	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	—	+	+	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
+	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	.....	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	—	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	0	.....	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
+	0	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
—	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	0	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	—	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	0	+	+	+	.....	.....	.....	.....
+	+	+	.....	.....	.....	+	+	+	+	.....	.....	.....	.....
0	0	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "C"—RATE, 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour.		Serial No.	Bacterial Counts.					
				18°–22°C.		37.5°C.		Influent.	
	A.M.	P.M		Inf.	Eff.	Inf.	Eff.	.001 C.C.	.002 C.C.
1911									
Aug. 5.....	10.00	.....	276	200,000	40	15,000	8	+	.
9.....	.....	4.00 and	stopped scraped	42,666	61.1	4,322	17.6		
10.....	11.10	.....	start						
	11.10	.....	277	30,000	280	10,000	26		
	11.20	.....	278	.....	.....	.....	12		
	11.30	.....	279	.....	.....	.....	16		
	11.40	.....	280	.....	.....	.....	30		
	11.50	.....	281	.....	.....	.....	26		
	12.00	.....	282	30.000	88	10,000	18		0
10.....	12.15	.....	283	.....	.....	.....	20	.....	.....
	12.30	.....	284	.....	.....	.....	20	.....	.....
	12.45	.....	285	.....	.....	.....	10	.....	.....
	.....	1.30	286	.....	.....	.....	6	.....	.....
	.....	2.00	287	.....	.....	.....	9	.....	.....
	.....	2.30	288	.....	.....	.....	10	.....	.....
	.....	3.30	289	.....	.....	.....	5	.....	.....
	.....	4.30	290	7.500	67	3,300	11	0	0
11.....	10.00	.....	291	12.000	110	2,000	33	.....	0
				19.875	136.2	6,325	16.8		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
—	+	+	+	.....	.....	0	0	+	+				
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
—	+	+	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	+	0	.....	.....	.....	0	0	+	+	.....	.....	.....	.....
0	+	+	.....	.....	.....	0	0	+	+	.....	.....	.....	.....

APPENDIX B—

SAND

TANK "D"—RATE, 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. .001 C.C.	Influent. .002 C.C.
March 16	10.00	.....	1	96	24	.....	11	.....	0
	.....	1.00	2	32	19	.....	15	.....	.....
17	10.00	.....	.....	85	18	19	—	0	0
18	10.00	.....	.....	120	48	20	18	[illegible]	[illegible]
				83	27	20	15		
23	.....	5.00	1	85	370	47	170	0	00
25	.....	1.00	2	80	57	30	8	0	00
27	.....	5.00	3	472	530	38	7	0	00
28	10.00	.....	4	high	290	60	5	0	0
	.....	5.00	5	6.000	200	58	6	0	00
29	10.00	.....	6	243	13	50	7	0	00
	.....	5.00	7	150	73	40	8	0	00
30	10.00	.....	8	257	.....	.....	.....	0	00
	.....	5.00	9	151	6	96	6	0	00
31	11.00	.....	10	9,600	150	136	7	0	[illegible]
	.....	5.00	11	670	180	166	80	0	[illegible]
April 1	10.00 orifice	..... box calib	stop rated	1,771.	1,869	72.1	30.4		
	10.00	.....	12	960	24	78	12	0	00
5	11.00	.....	start	after	cleaning				
5	.....	5.00	15	109	80	40	8	0	00
6	10.00	.....	16	131	2	64	1	0	00

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
.01 C.C.	.02 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	.05 C.C.	.1 C.C.	1 C.C.	5 C.C.	10 C.C.	20 C.C.	30 C.C.	50 C.C.
0	00	00	.....	.....	.....	.....	.....	00	0+	00	.....	.....	.....
		00								00			
.....	.....	00	.....	.....	.....	.....	.....	0	.....	00	.....	.....	.....
0+	++	++	.....	.....	.....	.....	.....	.....	00	00	.....	.....	.....
++	++	++	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
00	.....	0	+	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
00	.....	+	+	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
00	.....	0	0	.....	+	0	0	0	.....	0	0	.....	00
0	.....	0	+	.....	+	0	0	0	.....	.....	00	.....	00
00	.....	0	0	.....	+	0	0	0	.....	—	0	.....	000
00	.....	0	.....	.....	—	.....	.....	.....	.....	.....	0	.....	000
00	.....	0	+	.....	+	.....	.....	.....	.....	.....	0	.....	000
+0	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	00
0—	.....	0	0	.....	0	0	0	0	.....	0	.....	.....	00
++	.....	+	.....	.....	+	.....	.....	.....	.....	00	.....	.....	0—
++	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
00	.....	0	.....	.....	0	.....	.....	0	.....	00	.....	.....	00
00	.....	0	—	.....	0	0	0	0	.....	.....	0	.....	00
00	.....	.....	—	.....	0	0	0	0	.....	.....	0	.....	00

APPENDIX B—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
April 7.....	10.30	.....	17	130	.....	54	7	0	0
.....	.....	5.00	18	48	5	24	5	0	0
8.....	.....	1.00	19	43	5	.....	3	0	00
10.....	11.30	... .	20	73	6	16	1	0	00
.....	.....	5.00	21	60	1	31	1	0	0
11.....	10.00	.....	22	53	15	33	.....	0	0
.....	.....	5.00	23	187	21	.....	4	0	0
12.....	11.00	.....	24	75	15	38	3	0	0
12.....	.....	5.30	stop	91.0	16.6	37.5	3.66		
.....	.....	5.30	25	high	21	33	3		
13.....	.....	5.00	26	40	6	21	4		
17.....	10.00	.....	29	500	180	20	2	0	0
.....	.....	1.00	30	170	6	14	24	0	0
.....	.....	5.00	31	190	35	19	1	0	0
18.....	10.00	.....	32	132	47	10	2	0	0
	11.00	.....	cleaned	206	49.1	19.5	6.		
	.....	1.00	33	91	—	9	—	0	0
	.....	3.00	start						
	.....	5.00	34	14	5	—	3		
19.....	10.00	.....	35	425	22	20	0	0	0
.....	.....	1.00	36	480	3	10	1		
.....	.....	5.00	37	48	2	16	19		0
20.....	10.30	.....	38	176	3	23	1	0	0
.....	.....	5.00	39	31	2	18	4	0	0
21.....	10.00	.....	40	400	17	12	2	0	0
.....	.....	2.00	41	135	10	16	3	0	0
.....	.....	5.00	42	114	11	7	14		
22.....	10.00	.....	43	223	5	25	14	0	0
.....	.....	2.30	44	87	1	11	5	0	0
24.....	10.00	.....	stop	185.3	7.4	15.1	6		
	10.00	.....	45	150	5	21	2	0	0
	.....	2.30	46	80	2	18	0	0	0
	.....	5.00	47	140	5	26	1	0	0
25.....	10.00	.....	48	310	52	36	5	0	0
	11.00	.....	cleaned	170	16	25	2		
	2.00	2.00	start						
	.....	5.00	49	140	5	26	—	0	0
26.....	10.00	1.00	50	360	6	21	1	0	0
	11.20	.....	51	110	9	17	6	0	0
	.....	5.00	52	116	16	13	5	0	0
27.....	10.00	.....	53	212	15	27	2	0	0
.....	.....	1.30	54	170	13	25	4	0	0
.....	.....	5.00	55	124	2	11	1	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
0	.....	.....	0	.....	0	0	0	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
00	.....	0	.....	.....	00	.....	0	0	.....	.....	0	.....	00
00	.....	0	.....	.....	00	.....	0	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	0	.....	.....	.....	00	.....	+0
0	.....	+	.....	.....	00	.....	.....	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	0	0	.....	.....	0	.....	0+
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	0	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	0	0	.....	.....	0	.....	00
.....	.....	0	.....	.....	00	.....	0	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	+0	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	0	.....	.....	0+	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	++	0	0	0	.....	.....	0	.....	00
.....	.....	.....	.....	.....	.....	.....	0	0	.....	.....	0	.....	00
0	.....	+	.....	.....	0	.....	0	.....	.....	.....	0	.....	0
0	.....	0	.....	.....	.....	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0+	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0+	.....	0	0	.....	.....	0	.....	00
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	0	.....	.....	00	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	0	.....	.....	0+	0	0	0	0	.....	0	.....	0
0	.....	0	.....	.....	D — — D	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	D — — D			0	0	.....	0	.....	00
0	.....	0	.....	.....	D — — D	0	0	0	.....	.....	0	.....	0
0	.....	D —	.....	.....	— —	.....	.....	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	— —	.....	.....	.....	0	.....	0	.....	00
0	.....	0	.....	.....	— —	.....	.....	.....	0	.....	0	.....	00
0	.....	0	.....	.....	00	.....	.....	0	.....	.....	0	.....	0

APPENDIX B—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
April 28.....	10.00	.....	Orifice	box down to 3 in.					
	10.00	.....	56	268	42	30	2	0	0
	.....	2.30	57	210	155	40	2	0	0
	.....	5.00	58	270	14	24	4	0	0
29.....	10.00	.....	stop	198.0	27.7	23.4	3		
	10.00	.....	59	223	11	12	0		
	.....	2.00	60	115	4	20	13	0	0
May 1.....	10.00	.....	61	162	—	28	11	0	0
	12.00	.....	cleaned	166.6	7.5	20	8		
	.....	3. 0	start						
	.....	4.00	63	114	4	10	6	0	0
2.....	10.30	.....	64	3.200	8	340	3	0	0
2.....	.....	4.00	65	210	4	21	7	0	0
3.....	10.30	.....	66	300	7	16	2	0	0
	.....	2.00	74	120	1	13	—	0	0
	.....	5.00	77	66	3	10	5		
4.....	12.00	.....	78	172	7	17	2	0	0
	.....	5.00	80	164	3	9	3	0	0
5.....	12.00	.....	81	164	44	8	1	0	0
	.....	5.00	82	240	12	40	3	0	0
6.....	10.00	.....	83	1,900	5	—	—	0	0
	.....	12.00	84	300	4	9	4	0	0
8.....	10.00	.....	stop	580.	8.5	44.8	3.6		
9.....	10.00	.....	85	180	infect	63	infect	0	0
	.....	2.30	86	87	25	11	3	0	0
	.....	5.00	87	147	8	13	4	0	0
10.....	12.00	.....	88	140	15	6	—	0	0
	.....	4.20	ran at	full rate till 10.00 a.m..			10th.		
				138.5	16	23.2	3.5		
	.....	5.00	89	103	35	11	9	.....	
11.....	10.00	.....	stop	cleaned	started	at 1.00	p.m.		
	10.00	.....	start 1 p.m.	90 185	3	15	5	0	0
	.....	2.30	91	112	12	5	4	0	0
	.....	5.00	92	103	128	11	4	0	0
12.....	11.00	.....	93	45	26	9	—	0	0
	.....	5.00	94	150	33	14	10	0	0
13.....	10.00	.....	95	120	8	6	1	0	0
	.....	2.30	96	70	8	4	1	0	0
15.....	9.00	.....	stop	112.1	31.1	9.1	4.1		
16.....	10.00	.....	97	210	5	10	2	.....	0
	.....	2.30	98	cleaned	at 3.30	p.m.			
				320	4	12	2	.....	0
	.....	4.30	99	225	70	7	9	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
0	.....		.....	.....		0	0	0	.....	.....	0	.....	00
-	.....	0	.....	.....		.....	0	0	.....	.....		.....	-
0	.....	0	.....	.....	0	.....	0	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	0	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	—0	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	00	0	0	0	.....	.....	0	.....	00
-	.....	.....	.....	.....	—	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	0	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0—	0	0	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
-	.....	.....	.....	.....	-	0	0	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	0	0	0	.....	.....	0	.....	0
-	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	0	.....	0
0	.....	0	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
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0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
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0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
0	.....	+	.....	.....	-	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	0	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	0	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	0	0	.....	.....	0	.....	00

APPENDIX B—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
May 17.....	9.00	.....	start	251.6	26.3	9.6	4.3		
	11.00	.....	100	300	2	9	0	0	0
	.....	2.30	101	700	1	11	1	0	0
	.....	5.00	102	400	10	3	1	.....	0
18.....	11.00	.....	103	130	3	9	0	.....	.....
	.....	2.00	104	225	0	12	1	.....	.....
19.....	10.00	.....	105	250	11	25	7	.....	0
	10.20	.....	stop	334.1	4.5	11.5	1.7		
	.....	1.30	106	73	16	10	0	.....	0
	.....	5.00	107	195	11	3	1	.....	.....
20.....	10.00	.....	108	190	24	22	6	0	0
	.....	1.00	109	1,600	8	700	4	+	+
22.....	10.00	.....	cleaned	514.5	14.7	183.7	2.7		
	12.00	.....	start						
	.....	2.00	110	.....	.....	9	0	0	0
	.....	5.00	111	650	11	3	5	0	0
23.....	10.00	.....	112	770	3	10	2	0	0
	.....	1.00	113	300	5	20	2	0	0
	.....	5.00	stopped	36 hours	over	holiday			
				573.3	6.3	10.5	2.2		
25.....	10.00	.....	start						
	.....	2.00	114	340	3	12	5	0	0
	.....	5.00	115	150	32	3	.....	0	0
26.....	10.00	.....	116	30,000	16	140	4	0	0
	.....	1.00	stop	10,163	17	51.6	4.5		
	.....	5.00	117	100	15	33	0	0	0
27.....	10.00	.....	118	60	6	—	2	0	0
	.....	12.00	119	20	30	5	2	0	0
29.....	10.00	.....	120	120	34	4	4	0	0
	12.00	.....	121	140	45	9	14	0	
	.....	2.00	cleaned	88	26	12.7	4.4		
	.....	4.00	start						
31.....	10.00	.....	122	90	7	9	0	0	0
	.....	1.00	123	400	4	10	1	0	0
	.....	5.00	124	40	1	1	3	0	0
June 1.....	10 00	.....	125	540	2	14	3	0	0
	.....	4.00	126	40	6	—	0	0	0
2.....	10.00	.....	127	256	5	10	1	—	—
	.....	2.30	128	500	2	5	1	0	—
	.....	5.00	129	800	5	4	—	0	0
3.....	10.00	.....	130	170	2	6	—	.....	0
3.....	.....	1.00	131	151	6	6	7	0	0
	.....	1.00 over we	shut off ek end	298.7	4.0	7.2	2.3		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
0	.....	0	.....	.....	0	0	0	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	+	.....	.....	-	.....	.....	0	.....	.....	0	.....	00
0	.....	—	.....	.....	0	.....	.....	0	.....	.....	0	.....	00
0	.....	0	.....	.....	0	.....	0	0	.....	.....	0	.....	0
-	.....	+	.....	.....		.....	0		.....	+	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	0
-	.....	+	.....	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	+	.....	.....	0	.....	.....	.....	.....	00	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
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0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
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0	.....	0	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	0	.....	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0

APPENDIX B—

SAND

TANK "D"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
June 5.....	.....	2.30	start						
	.....	2.30	132	360	16	10	1		+
6.....	11.00	.....	133	185	8	9	1	0	+
	.....	1.00	134	150	1	28	5	0	+
7.....	10.00	.....	stop	231.6	8.3	15.6	2.3		
	10.00	.....	135	50	10	12	2	0	0
	.....	1.00	136	146	5	11	0	0	0
	.....	5.00	137	11	3	2	3	0	+
8.....	10.00	.....	138	26	3	7	2	0	0
	.....	1.00	139	94	4	8	9	0	0
	.....	5.30	140	73	13	6	—	0	0
9.....	.....	1.00	cleaned	66.6	6.3	7.6	3.2		
10.....	10.00	.....	start						
	10.00	.....	141	50	6	6	4	0	0
	.....	1.00	142	58	9	5	3	0	0
	.....	1.00	stop	54	7.5	5.5	3.5		
11.....	10.30	.....	start						
12.....	10.30	.....	143	480	8	10	4	0	—
	.....	1.00	144	344	0	18	3	0	0
	.....	4.00	145	190	2	9	3	0	0
13.....	10.00	.....	146	270	6	15	3	0	—
	.....	12.00	147	240	7	8	2	—	—
	.....	4.00	148	100	5	16	—	0	0
14.....	11.00	.....	149	330	8	10	2	0	+
	.....	2.30	150	165	14	6	2	0	—
	.....	4.00	151	150	2	4	2	0	0
15.....	11.00	.....	152	210	4	16	0	—	—
15.....	.....	1.00	153	93	2	13	4		
	.....	4.30	154	150	100	7	—	0	+
16.....	10.00	.....	155	400	—	19	2	0	—
	.....	1.00	156	430	40	7	1		
	.....	5.00	157	260	75	13	2	0	0
17.....	10.00	.....	158	500	19	5	4	0	0
	stop over week		end	257.0	19.4	11.	2.4		
19.....	11.00	.....	start						
	11.00	.....	159	1,360	2	16	6	0	0
	.....	1.30	160	13	0	2	1	0	0
20.....	10.00	.....	stop	686.5	1	9	3.5		
	10.00	.....	161	64	8	9	.....	0	+
	12.00	.....	162	60	21	1	.....		
	.....	3.30	163	480	60	10	.....	0	+
21.....	10.30	.....	164	110	21	16	1		
	.....	2.00	scraped	178.5	27.5	9	1		
	.....	2.00	165	—	1	—	0	0	0
	.....	5.00	166	10	6	—	2		
26.....	10.30	.....	start	10	35.5	—	1		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	—	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
—	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	—	.....	.....	0	.....	.....	0	.....	0
—	.....	—	.....	.....	—	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
—	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
—	.....	—	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
—	.....	—	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	0	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	—	.....	.....	—	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0

APPENDIX B—
SAND

EXPERIMENTAL STATION. TANK "D"—RATE 5,000,000 GALLONS

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°-22°C. Inf.	18°-22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
June 26.....	10.30	.....	167	144	5	8	3	0	+
.....		12.30	stop						
.....		2.00	168	200	14	11	5	0	0
.....		4.30	169	66	9	5	7	0	0
27.....	10.00	start	.....	133	11.5	8	6		
	10.00	.....	170	325	7	10	1	0	+
28.....	11.00	.....	171	320	7	37	2	0	+
	12.00	.....	172	150	7	5	1	0	+
	12.00	.....	stop	265	7	17.3	1.3		
.....		2.00	173	—	7	—	—		
29.....	10.00	.....	174	212	28	8	5	0	+
				212	17.5	8	5		
29.....	10.00	.....	start	.....	.....	.....	.....	.....	.....
	12.00	.....	stop	.....	.....	.....	.....	.....	.....
.....		2.30	175	320	8	10	0	0	0
30.....	10.00	.....	176	166	20	2	2	0	0
	12.30	.....	177	190	10	1	2	0	0
July 3.....	10.00	.....	178	500	10	8	3	0	+
	10.00	.....	start	294	12	5.25	1.75		
	12.00	.....	179	20	3	9	2	0	+
.....		5.00	180	2	45	1	3	.....	.....
4.....	12.30	.....	181	76	4	5	4	.....	.....
.....		4.00	182	300	1	0	2	.....	.....
5.....	10.00	.....	183	100	3	1	2	0	0
	12.00	.....	raked	99.6	11.2	3.2	2.6		
.....		1.00	184	50	2	0	1	0	0
.....		5.00	185	122	1	1	1	0	+
6.....	.....	1.00	start	86	1.5	.5	1		
.....		1.00	186	93	16	0	2	0	0
.....		2.00	187	95	—	0	.....	0	0
.....		5.00	188	227	10	2	5	0	0
7.....	10.00	.....	189	560	6	100	1	0	0
.....		2.00	190	660	22	151	5	0	0
10.....	.....	1.00	191	7	6	0	1	0	0
11.....	10.00	.....	192	8	—	1	0	0	0
.....		12.00	193	—	2	1	0	0	+
.....		4.00	194	—	—	1	0	0	0
12.....	10.00	.....	195	56	31	4	3	0	0
.....		1.00	196	78	33	0	0	0	0
.....		5.00	197	8	8	—	2	0	0
13.....	10.00	.....	198	60	71	17	—	0	+
.....		1.00	199	46	60	5	1	0	—
14.....	10.30	.....	200	—	33	—	0	0	.....
.....		5.00	201	6	53	2	9	0	0
17.....	10.00	.....	203	100	52	14	6	0	0
.....		1.00	204	80	54	4	2	0	+
.....		5.00	205	125	100	9	0	.....	+
18.....	10.30	.....	206	20	28	2	2	0	0

Continued.
FILTERS.
PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	+	.....	.....	+	.....	+
0	.....	—	.....	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
+	.....	+	.....	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	0	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	0	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	0	.....	.....	+
—	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	0	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
0	.....	.....	+	.....	.....	.....	.....	0	.....	0	.....	.....	0
—	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	0	.....	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	+
0	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	.....	—	.....	—
—	.....	.....	—	.....	—	.....	.....	0	.....	.....	0	.....	0

APPENDIX B—
SAND

EXPERIMENTAL STATION. TANK "D"—RATE 5,000,000 GALLONS

Date.	Hour. A.M.	Hour. P.M	Serial No.	Bacterial Counts. 18°–22°C. Inf.	18°–22°C. Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1911									
July 18	12.00	.....	207	8	24	6	5	0	—
	.....	4.00	208	167	83	10	1	0	0
19	10.00	.....	209	17	46	1	4	0	0
	12.00	.....	210	400	32	173	4	0	0
	.....	4.00	211	88	52	5	5	0	0
20	10 00	.....	212	125	40	4	2	0	.....
	.....	2.00	213	90	15	4	4	0	+
21	10.00	.....	214	24	23	2	0	0	-
22	12.00	.....	215	305	11	5	12	0	0
	.....	1.00	216	250	14	3	19	.....	.....
23	10.00	.....	217	570	10	1	1	0	+
	.....	1.00	218	540	17	2	0	0	+
	.....	5.00	219	110	8	0	5	0	0
25	10.00	.....	220	480	5	39	17	0	0
	.....	1.00	221	154	7	5	2	0	0
	.....	5.00	222	120	6	4	2	+	0
26	10.00	.....	223	28	7	1	2	0	0
	.....	1.00	224	34	17	1	1	0	0
	.....	5.00	225	126	2	4	0	0	0
27	10.00	.....	226	100	5	1	3	0	0
	.....	1.00	227	110	4	—	1	0	0
	.....	5.00	228	37	6	1	1	0	0
28	10.00	.....	229	93	34	1	0	0	0
	.....	12.00	230	270	4	0	1	0	0
	.....	5.00	231	70	15	2	1	0	0
29	10.00	.....	232	33	4	3	3	0	0
	11.30	cleaned	raked	153.2	25.0	13.5	3.07		
	.....	4.00	start						
	.....	5.30	233	22	10	0	2	0	0
31	10.00	.....	234	150	—	1	1	0	0
	.....	12.30	235	116	4	2	2	0	0
	.....	5.00	236	35	2	1	1	0	0
Aug. 1	10.00	.....	237	380	15	3	1	0	0
	.....	1.00	238	180	5	1	3	0	0
2	10.30	.....	239	76	10	0	1	0	0
	.....	1.00	240	126	2	0	1	0	0
	.....	5.00	241	111	4	1	1	0	0
3	10.00	.....	242	800	9	6	4	0	0
	.....	2.00	243	400	20	0	1	0	0
4	11.00	.....	244	300	38	6	1	0	0
	.....	1.00	245	114	17	2	0	0	0
	.....	4.30	246	130	19	1	2	0	0
5	10.00	.....	247	200	10	0	0	0	0
8	10.00	.....	248	30	6	16	0	0	0
	.....	2.00	249	100	9	14	1	0	—
	.....	5.00	250	20	10	7	1	0	0
9	10.00	.....	251	134	10	2	2	0	0
	.....	1.00	252	67	2	0	1	0	0
	.....	4.30	253	2	1	2	0	0	0
10	11.00	.....	254	60	18	0	2		0
	12.00	.....	255	90	7	0	0	.....	.....
10	.....	4.30	256	52	1	0	0	0	0
11	10.00	.....	257	80	11	2	1	0	0
				150.6	99	2.6	1.1		

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
—	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	+	.....	.....	0	.....	.....	0	.....	+
0	.....	.....	+	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	+	.....	.....	.....	.....	.....	.....	.....	.....
-	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	—	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	0	+	+	.....	.....	-	.....	-
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
+	.....	.....	+	.....	+	0	.....	0	.....	.....	0	.....	-
0	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
0	.....	.....	+	.....	+	0	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	0	.....	0	.....	.....	0	.....	0
0	.....	.....	+	.....	+	0	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	0	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	—
0	.....	.....	0	.....	0	.....	.....	+	.....	.....	0	.....	0
0	.....	.....	0	.....	0	0	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	0	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	+	.....	0
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0
0	.....	.....	0	.....	0	.....	.....	+	.....	.....	+	.....	+
0	.....	.....	0	.....	0	.....	.....	0	.....	.....	0	.....	0

APPENDIX C.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank A.—Twenty Million Gallons per Acre per Day.

Time Started	Time Stopped	Length of Run in Hours	Gallons Discharged per Run.	Average Bact. Effcy. per Run.	Remarks		
					Raw Water Count	Filtered Water Count	Weight
1909							
10.20 a.m., Sep. 15	10.15 a.m., Sep. 17	48.0	79,968	78.2	215	47.0	7
4.15 p.m., Sep. 17	11.00 a.m., Sep. 20	67.75	112,900	81.8	330	60.0	1
4.00 p.m., Sep. 20	9.30 a.m., Sep. 21	17.5	29,100	87.2	155	20.0	2
3.00 p.m., Sep. 21	9.00 a.m., Sep. 23	42.5	70,800	95.1	409.5	20.5	4
12.45 p.m., Sep. 23	11.30 a.m., Sep. 25	47.25	78,750	98.3	402	6.8	5
3.30 p.m., Sep. 25	3.00 p.m., Sep. 27	47.5	79,100	98.3	413	6.3	3
9.30 a.m., Sep. 28	9.30 a.m., Sep. 30	48.0	79,900	97.9	654	13.6	5
2.50 p.m , Sep. 30	10.50 a.m., Oct. 2	44.0	73,250	96.8	214	6.4	9
1.00 p.m., Oct. 2	12.00 a.m., Oct. 4	47.0	73,300	95.1	140	7.0	1
4.45 p.m., Oct. 4	3.00 p.m., Oct. 7	70.25	116,000	97.8	265.5	6.1	8
10.15 a,m., Oct. 8	7.00 a.m., Oct. 12	92.75	154,400	97.7	3742.0	10.8	7
12.45 p.m., Oct. 12	5.00 p.m., Oct. 15	77.25	128,600	94.1	290.2	17.1	10
12.30 p.m., Oct. 16	9.30 a.m., Oct. 19	69.5	115,800	97.4	169.6	4.6	3
3.30 p.m.. Oct. 19	9.30 a.m., Oct. 21	41.5	69,200	95.4	1705.0	78.2	4
3.30 p.m., Oct. 26	3.00 p.m., Oct. 29	59.5	99,200	98.3	72.2	15.0	7
12.00 a.m., Oct. 30	10.00 a.m., Nov. 2	44.0	73,250	90.4	73.3	7.0	3
9.30 a.m., Nov. 5	9.30 a.m., Nov. 9	96.0	159,900	92.0	65.0	5.2	7
3.45 p.m., Nov. 9	9.30 a.m., Nov. 10	17.75	29,600	38.5	65.0	40.0	1
3.00 p.m., Nov. 10	4.00 p.m., Nov. 11	25.0	41,700	95.6	57.5	2.5	4
12.00 a.m., Nov. 12	9.30 a.m., Nov. 15	45.5	75,800	80.7	100.0	19.3	3
9.45 a.m., Nov. 23	3.00 p.m., Nov. 24	29.25	48,748	97.2	2728.0	75.4	5
4.30 p.m., Dec. 6	9.30 a.m., Dec. 7	17.0	28,332	.....	.....	.....	.....
Average length of run	.....	49.30	.....	.....	.....	.....	99
Average discharge	.....	.....	76,076	93.5	.....	.....	.....
Average bact. effcy.	.....	.....	.....	96.2	.....	.....	.....
Average raw water count.....	.....	.....	.....	.....	584.0	.....	.....
Average filtered water count.....	.....	.....	.....	.....	.....	22.2	.....

38,038,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank A.—Five Million Gallons per Acre per Day.

Time started.	Time stopped	Length of run in hours	Gallons discharged per run	Average Bact. effcy. per run.	18°–22° Count.				
					Raw.		Filtered		Weight
					Av'ge	Max.	Av'ge	Max.	
1910									
4 p.m., Feb. 16	5 p.m., Feb. 18	49.0	20,400	84.7	725.5	940	111.0	320	7
12 a.m., Feb. 21	10 a.m., Mar. 7	334.50	139,300	83.3	903.5	4,900	150.6	860	33
5 p.m., Mar. 8	9 a.m., Mar. 29	496.00	20,700	91.6	868.0	3,980	73.0	358	36
10 a.m., Apr. 4	1 p.m., Apr. 9	122.50	51,100	84.1	73.2	240	11.6	105	16
1 p.m., May 4	5 p.m., May 18	340.0	141,600	93.7	91.5	230	5.9	25	28
11 a.m., May 21	10 a.m., May 26	119.0	49,600	98.75	44.2	147	.6	3	5
2 p.m., May 28	4 p.m., June 4	170.0	70,900	98.2	138.1	1,440	2.53	5	17
1 p.m., June 6	12 a.m., June 14	190.50	79,400	97.2	133.8	500	3.7	14	18
4 p.m., June 14	12 a.m., June 15	92.00	38,400	88.1	64.0	130	7.6	17	10
4 p.m., June 21	4 a.m., July 23	768.0	320,300	93.0	115.0	430	8.0	18	48
4 p.m., July 26	4 p.m., Aug. 23	672.0	280,100	94.5	94.7	436	5.1	33	39
12 a.m., Aug. 30	12 a.m., Sep. 12	312.0	129,900	85.7	244.7	1,440	35.1	156	27
2.45 p.m., Sep. 12	9.30 a.m., Sept. 30	426.75	177,800	96.7	323.6	2,000	10.7	60	21
5 p.m., Sep. 30	10 a.m., Oct. 22	521.00	217,100	95.7	277.1	1,200	12.0	70	18
	Averages ...	329.5	137,200	91.5	.....	.....	.....	.....	323

68,600 gallons per acre per run.

10 Mill. Gals. per Ac. per Day.

10 a.m., Oct. 24	5 p.m., Nov. 1	199.0	165,800	46,9	111.3	240	59.6	274	8
4 p.m., Nov. 8	4 p.m., Nov. 10	47.5	39,600	.....	93.5	186	1600.0	2,500	2
12 a.m., Nov. 4	9.30 a.m., Nov. 7	69.5	57,900	.....	101.0	150	108.5	200	2
	Averages ...	105.3	87,800	.....	.....	.....	.....	.....	.....

43,900,000 gallons per acre per run.

3 Mill. Gals. per Ac. per Day.

10 a.m., Nov. 12	5 p.m., Jan. 3	.....	.....	.....	32.6	458	273.6	3,000	30
" "	5 p.m., Dec. 1	463	116.700	.....	.....	.....	.....	.....	.....
4 p.m., Dec. 2	10 a.m., Dec. 15	306	76,500	.....	.....	.....	.....	.....	.....
3 p.m., Dec. 15	.....								
		384.5	96.600	.....	.....	.....	.....	.....	.....
	Averages ...	.....	.....	.....	.....	.....	.....	.....	.....

48,300,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank A.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. effcy. per run	18°-22°C Count				Weight
					Raw		Filtered		
					Av'ge	Max.	Av'ge	Max.	
1911									
12.45 a.m., Mar. 25	5.00 p.m., Apr. 5	268.25	107,000	60.7	9,500	30,000	3730	9,200	12
4.00 p.m., Apr. 6	1.00 p.m., Apr. 15	213	88,800	99.6	13,720	29,000	59	250	17
9.30 a.m., Apr. 20	10.00 a.m., Apr. 24	96.5	40,200	97.9	10,200	30,000	212	420	8
10.00 a.m., Apr. 26	1.00 p.m., Apr. 29	75	31,200	98.8	2,380	12,000	16.2	42	10
11.45 a.m., May 4	2.00 p.m., May 11	170.25	70,900	99.8	7,000	27,000	14.5	25	16
9.30 a.m., May 13	9.30 a.m., May 15	48	20,000	99.9	26,700	39,000	15	16	2
9.00 a.m., May 17	5.00 p.m., May 19	56	23,300	99.9	25,428	30,000	21.1	32	7
1.05 p.m., May 23	12.00 a.m., May 27	59	24,600	99.8	56,489	280,000	116.5	480	18
12.00 a.m., May 29	10.00 a.m., June 6	166	69,200	99.9	39,570	120,000	43.7	84	11
10.30 a.m., June 11	12.00 a.m., June 17	148.5	61,900	99.5	5,412	15,000	29.0	80	18
10.30 a.m., June 26	10.00 a.m., June 30	75.5	31,500	99.9	89,250	100,000	93.7	200	12
10.00 a.m., July 4	10.00 a.m., July 6	48.0	2,000	98.5	3,800	7,600	56.2	93	5
1.00 p.m., July 6	5.00 p.m., July 7	28	11,700	97.5	1,918	2,700	48.8	78	5
10.00 a.m., July 12	10.00 a.m., July 13	24	10,000	....	130	300	983	2,500	3
Averages	.....	105.4	43,950	99.4	.....	.....	.....	.....	139

21,975,000 gallons per acre per run.

RATE, 10 MILLION GALLONS PER ACRE PER DAY.

10.30 a.m., July 14	10.30 a.m., July 18	96	80,000	92.1	3,426.6	8,000	260.7	1,000	9
10.00 a.m., July 19	10.00 a.m., July 24	120	100,000	99.3	660	13,500	44.4	82	9
10.00 a.m., July 25	10.00 a.m., July 28	68	56,700	99.3	20,240	46,600	185.1	370	10
10.00 a.m., July 29	10.00 a.m., July 31	48	40,000	98.5	2,750	3,300	41	50	2
10.20 a.m., Aug. 2	10.00 a.m., Aug. 7	120	100,000	99.5	48,400	200,000	226.9	1,100	10
10.10 a.m., Aug. 10	10.00 a.m., Aug. 11	no he	ad loss	98.6	16,875	30,000	230.7	260	4
Averages	.....	90.4	75,300	97.7	.....	.....	.....	.....	42

Or 37,650,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank A.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average Bact. Effcy. per run	37°C Count				Weight
					Raw		Filtered		
					Ave'ge	Max.	Ave.	Max.	
1911									
12.45 a.m., Mar. 25	5.00 p.m., Apr. 5	268.25	107,000	92.5	2760	5,600	206	880	13
4.00 p.m., Apr. 6	1.00 p.m., Apr. 15	213	88,800	99.6	3640	6,300	17	90	15
9.30 a.m., Apr. 20	10.00 a.m., Apr. 24	96.5	40,200	99.7	2710	8,200	9.5	14	8
10.00 a.m., Apr. 26	1.00 p.m., Apr. 29	75	31,200	98.9	607	4,000	6.8	10	10
11.45 a.m., May 4	2.00 p.m., May 11	170.25	70,900	99.9	2390	14,000	3.6	13	16
9.30 a.m., May 13	9.30 a.m., May 15	48	20,000	99.9	6150	7,100	6	7	2
9.00 a.m., May 17	5.00 p.m., May 19	56	23,300	99.9	3871	7,300	6.1	15	7
1.05 p.m., May 23	12.00 a.m., May 27	59	24,600	99.7	9410	36,000	25.2	77	17
12.00 a.m., May 29	10.00 a.m., June 5	166	69,200	99.7	6620	10,700	12.4	34	11
10.30 a.m., June 11	12.00 a.m., June 17	148.5	61,900	98.9	936	4,600	9.4	25	18
10.30 a.m., June 26	10.00 a.m., June 30	75.5	31,500	99.7	6991	18,500	18.5	43	10
10.00 a.m., July 4	10.00 a.m., July 6	48	20,000	97.4	1070	3,500	28.2	72	5
1.00 p.m., July 6	5.00 p.m., July 7	28	11,700	97.4	582	1,200	15.2	24	5
10.00 a.m., July 12	10.00 a.m., July 13	24	10,000	....	12	24	113	300	3
	Averages	105.4	43,950	99.4	.....	.....	.....	.....	124

or 21,975,000 gallons per acre per run.

RATE 10 MILLION GALLONS PER ACRE PER DAY.

10.30 a.m., July 14	10.30 a.m., July 18	96	80,000	93.8	1380.7	4,000	86.1	390	20
10.00 a.m., July 19	10.00 a.m., July 24	120	100,000	99.3	2345	7,100	16.6	34	9
10.00 a.m., July 25	10.00 p.m., July 28	68	56,700	99.3	9530	30,000	67.6	200	14
10.00 a.m., July 29	10.00 a.m., July 31	48	40,000	97.3	550	800	15.	19	2
10.20 a.m., Aug. 2	10.00 a.m., Aug. 7	120	100,000	96.6	3637.7	15,000	124.7	550	21
11.10 a.m., Aug. 10	10.00 a.m., Aug. 11	.....	.....	99.1	6325	10,000	65.2	115	15
	Averages	90.4	75,300	97.2	.....	.....	.....	.....	81

or 37,650,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank B.—Fifteen Million Gallons per Acre per Day.

Time started.	Time stopped.	Length of run in hours.	Gallons discharged per run.	Average bact. effcy. per run.	18°–22°C Count		Weight.
					Raw water count.	Filtered water count.	
1909							
10.20 a.m., Sep. 15	4,15 p.m., Sep. 17	54.0	67,500	75.0	173.3	43.3	9
11.40 a.m., Sep. 18	4.00 p.m., Sep. 20	52.25	65,250	94.6	205.0	15.0	2
11.45 a.m., Sep. 21	9.30 a.m., Sep. 23	43.75	54,700	96.2	344.6	13.3	6
12.45 p.m., Sep. 23	8.30 a.m., Sep. 27	111.5	139,400	99.8	3240.0	5.2	6
12.30 p.m., Sep. 27	4.30 p.m., Sep. 29	52.0	65,000	99.1	788.3	6.5	6
2.50 p.m., Sep. 30	9.30 a.m., Oct. 4	66.75	83,400	97.4	219.5	6.1	10
3.00 p.m., Oct. 4	12.45 p.m., Oct. 8	93.75	117,100	97.9	292.6	6.1	12
5.00 p.m., Oct. 8	9.30 a.m., Oct. 14	136.5	170,600	99.4	198.9	1.6	12
12.15 a.m., Oct. 15	10.45 a.m., Oct. 19	95.0	118,900	97.9	170.1	3.5	6
9,30 a.m., Oct. 20	1.00 p.m., Oct. 21	27.5	34,390	96.9	1666.0	53.6	5
4.30 p.m., Oct. 21	9.00 a.m., Oct. 22	.....	.....	.....	.....	.....	.....
3.30 p.m., Oct. 26	12.00 a.m., Oct. 30	92.5	115,600	48.6	71.2	36.6	9
11.30 a.m., Nov. 1	10.00 a.m., Nov 6	92.5	115,600	83.1	56.0	9.5	7
1.00 p.m., Nov. 6	9.30 a.m., Nov. 10	92.5	115,600	89.0	76.0	8.4	5
12.00 a.m., Nov. 11	1.00 p.m., Nov. 13	49.0	61,300	92.3	75.0	5.8	4
2.00 p.m., Nov. 16	10.00 a.m., Nov. 18	44.0	55,000	97.5	395.0	10.0	1
9.30 a.m., Nov. 19	9.00 a.m., Nov. 23	94.5	118,100	97.6	2281.0	55.3	3
10.00 a.m., Nov. 27	4.00 p.m., Nov. 29	54.0	67,500	91.4	463.0	39.6	3
1.30 p.m., Nov. 30	9.30 a.m., Dec. 3	68.0	85,000	85.0	125.0	18.7	4
Average length of run		72.2	.....	.....	.....	.....	110
" Discharge		.....	91,657	.....	.....	.....	.....
" Bact. Effcy		.....	.....	89.9	.....	.....	.....
" Raw water count		.....	.....	.....	1157.7	.....	.....
" Filtered water count		.....	.....	.....	.....	18.7	.....

45,828,500 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank B.—Ten Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. effcy. per run	18°–22°C Count				No samples taken
					Raw		Filtered		
					Av'ge	Max.	Av'ge	Max.	
1910									
5.00 p.m., Feb. 16	9.30 a.m., Feb. 18	30.5	25,400	86.7	392.0	670	52.0	106	3
5.00 p.m., Feb. 18	10.00 a.m., Feb. 21	41.0	34,200	61.5	65.0	112	25.0	40	3
5.00 p.m., Feb. 21	10.30 a.m., Feb. 25	89.5	74,600	92.1	525.8	4110	42.3	170	10
4.30 p.m., Feb. 25	12.00 a.m., Mar. 5	187.5	156,200	77.0	1304.0	5200	299.0	806	18
5.00 p.m., Mar. 5	10.30 a.m., Mar. 18	305.5	254,600	82.8	1305.0	6880	224.0	598	27
9.00 a.m., Mar. 19	9.00 a.m., Mar. 29	240.0	200,000	89.0	315.0	960	33.7	104	10
10.30 a.m., Apr. 4	5.00 p.m., Apr. 6	54.5	45,800	66.8	82.5	180	27.4	120.0	8
2.45 p.m., May 6	4.30 p.m., May 12	145.75	121,500	89.4	91.2	230	9.7	57.0	15
3.00 p.m., May 13	4.30 p.m., May 17	97.5	81,200	89.2	70.5	106	7.6	18	5
11.00 a.m., May 21	10.00 a.m., May 25	95.0	79,200	94.4	79.5	147	4.5	5	2
4.00 p.m., May 27	11.00 a.m., June 2	139.0	115,800	88.8	58.9	100	6.6	28	13
2.00 p.m., June 3	10.30 p.m., June 8	116.5	97,100	98.7	233.9	1440	3.2	6	10
10.00 a.m., June 10	11.00 a.m., June 17	169.0	140,800	90.2	100.0	500	9.8	53	15
3.00 p.m., June 17	10.00 a.m., June 21	91.0	75,800	89.8	108.0	315	11.0	18	7
4.00 p.m., June 22	9.30 a.m., July 6	329.5	278,700	91.5	139.2	430	13.7	30	11
4.00 p.m., July 6	9.30 a.m., July 11	113.5	94,600	87.9	91.3	325.0	11.7	21	9
12.00 a.m., July 11	9.30 a.m., July 18	165.5	137,500	86.5	93.4	280	12.6	46	16
4.00 p.m., July 18	12.00 a.m., July 23	116.0	96,700	94.6	98.0	170	5.3	14.0	14
4.00 p.m., July 26	12.00 a.m., Aug. 3	164.0	136,700	90.5	93.4	350	8.8	50	12
2.00 p.m., Aug. 3	12.00 a.m., Aug. 13	238.0	198,500	97.1	57.1	181	1.6	7.0	19
11.30 a.m., Aug. 16	10.00 a.m., Aug. 18	46.5	38,700	98.5	93–5	137	1.5	3.0	4
Averages	.....	141.6	118,000	84.5	.....	.....	.....	.....	241

59,000,000 per acre per run.

RATE, FIVE MILLION GALLONS PER ACRE PER DAY.

3.00 p.m., Aug. 29	4.00 p.m., Sep. 6	193.0	80,400	86.1	270.5	1440	37.6	130	15.0
9.45 a.m., Sep. 8	5.00 p.m., Sep. 21	307.25	128,000	92.4	301.2	2000	23.0	150.0	24.0
12.00 a.m., Sep. 23	10.00 a.m., Oct. 3	248.00	103,300	94.3	375.0	710	21.3	91.0	8.0
5.00 p.m., Oct. 3	10.00 a.m., Oct. 22	449.00	187,000	98.1	265.0	1200	5.1	16.0	17.0
Averages	.....	299.56	125,000	92.7	.....	.....	.....	.....	64

62,500,000 gallons per acre per run.

RATE, TEN MILLION GALLONS PER ACRE PER DAY.

4.00 p.m., Oct. 24	5.00 p.m., Nov. 1	193.00	160.800	68.5	117.4	240	37.0	80	8
11.30 a.m., Nov. 8	4.00 p.m., Nov. 10	52.5	43,700	....	63.0	186	1666.6	2000	3
.....	.....	122.7	102,250	....	Infected filter				

51,125,000 gallons per acre per run.

RATE, THREE MILLION GALLONS PER ACRE PER DAY.

12.00 a.m., Nov. 12	10.00 a.m., Dec. 2	478.0	119,500	....	3.7	12.0	413.7	2000	16
12.30 a.m., Dec. 3	5.00 p.m., Dec. 15	.....	.....	36.7	60.0	458	37.6	181	15.0
.....	.....	.....	.....	....	Infected filter				

75,225,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911.

Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank B.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours.	Gallons discharged per run	Average bact. effcy. per run.	18°–22°C Count				Weight
					Raw		Filtered		
					Ave.	Max.	Ave.	Max.	
1911									
4.00 p.m., Mar. 29	5.00 p.m., April 5	169	70,400	....	10,707	30,000	19,918	46,500	7
4.00 p.m., Apr. 6	1.00 p.m., April 15	213	88,700	91.1	14,250	29,000	1,265	3,000	14
4.00 p.m., Apr. 19	10.00 a.m., April 22	66	27,500	98.6	12,614	30,000	179	370	7
10.00 a.m., Apr. 26	5.00 p.m., April 28	55	22,900	38.3	527	3,000	325	1,310	9
11.45 a.m., May 4	10.00 a.m., May 8	94.25	39,300	62.8	700	1,260	261	960	6
9.30 a.m., May 13	9.30 a.m., May 15	47.5	19,800	99.6	26,700	39,000	130	187	2
9.00 a.m., May 17	5.00 p.m., May 18	32	13,300	99.1	24,600	30,000	210	300	5
1.00 p.m., May 23	10.00 a.m., May 26	38	15,800	99.2	99,040	280,000	824	1,900	5
2.00 p.m., May 30	5.00 p.m., May 31	27	11,300	97.3	66,700	120,000	1843	2,600	3
2.30 p.m., June 5	10.30 a.m., June 8	68	28,300	99.3	36,471	136,000	309.6	500	12
10.00 a.m., June 10	5.00 p.m., June 14	81.5	34,000	97.4	2,568	13,500	66.3	240	11
11.00 a.m., June 16	12.00 a.m., June 17	25	10,400	99.4	8,250	13,500	47	67	2
11.00 a.m., June 19	10.30 a.m., June 21	47.5	19,800	97.8	13,616	25,000	293	800	6
10.30 a.m., June 26	11.00 a.m., June 28	49	20,400	98.1	16,400	27,000	325	610	6
12.00 a.m., July 3	2.00 p.m., July 6	74	30,800	96.9	23,044	120,000	711	2,900	10
Averages	.....	72.5	30,450	89.5	25,350	.....	485.5	.....	98

or 15,125,000 gallons per acre per run.

RATE, 10 MILLION GALLONS PER ACRE PER DAY.

10.00 a.m., July 12	12.00 a.m., July 14	50	41,700	53.3	3,298	10,000	1540	3,000	8
10.00 a.m., July 15	5.00 a.m., July 17	55	45,900	86.8	2,880	7,000	380	900	5
10.00 a.m., July 19	10.00 a.m., July 21	48	40,000	95.5	7,580	10,500	340	550	5
10.00 a.m., July 24	10.00 a.m., July 26	44.5	37,100	97.7	14,020	24,000	325.8	650	6
10.00 a.m., July 27	5.30 p.m., July 29	55	45,900	97.8	17,100	46,600	378.5	1,200	8
10.00 a.m., Aug. 1	10.00 a.m., Aug. 3	48	40,000	95.0	15,500	24,000	786	3,200	6
Averages	.....	.....	.....	86.3	10,063	.....	625.0	.....	38

or 20,875,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

Tank B.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. effcy. per run	37°C Count				Weight
					Raw		Filtered		
					Av'ge	Max.	Av'ge	Max.	
1911									
4.00 p.m., Mar. 29	5.00 p.m., Apr. 5	169	70,400	87.3	3267	5,600	417	1410	7
4.00 p.m., Apr. 6	1.00 p.m., Apr. 15	213	88,700	98.9	3572	6,300	40	90	15
4.00 p.m., Apr. 19	10.00 a.m., Apr. 22	66	27,500	99.5	3581	9,000	18.7	38	7
10.00 a.m., Apr. 26	5.00 p.m., Apr. 28	55	22,900	80.4	66.3	400	13	34	9
11.45 a.m., May 4	10.00 a.m., May 8	94.25	39,300	76.6	47	90	11	22	6
9.30 a.m., May 13	9.00 a.m., May 15	47.5	19,800	99.4	6150	7,100	40.5	56	2
9.00 a.m., May 17	5.00 a.m., May 18	32	13,300	98.5	3000	4,000	46	74	5
1.00 p.m., May 23	10.00 a.m., May 26	38	15,800	99.5	15420	36,000	72.7	180	5
2.00 p.m., May 30	5.00 p.m., May 31	27	11,300	93.6	6550	10,700	413.3	480	3
2.30 p.m., June 5	10.30 a.m., June 8	68	28,300	98.7	6291	21,000	82.6	210	12
10.00 a.m., June 10	5.00 p.m., June 14	81,5	34,000	93.2	304.8	1,600	20.7	90	11
11.00 a.m., June 16	12.00 a.m., June 17	25	10,400	99.1	1250	2,200	12	12	1
11.00 a.m., June 19	10.30 a.m., June 21	47.5	19,800	97.5	4541	12,000	112	240	6
10.30 a.m., June 26	11.00 a.m., June 28	49	20,400	98.1	5333	8,500	104.6	315	6
12.00 a.m., July 3	2.00 p.m., July 6	74	30,800	94.6	1540	6,000	83.3	245	10
Averages	.....	72.5	30,450	94.5	3340	.....	82.7	.....	98

Or 15,125,000 gallons per acre per run.

RATE, 10 MILLION GALLONS PER ACRE PER DAY.

10.00 a.m., July 12	12.00 a.m., July 14	50	41,700	91.9	1595	4,800	130	300	8
10.00 a.m., July 15	5.00 a.m., July 17	55	45,900	86.0	904.6	4,000	127	300	5
10.00 a.m., July 19	10.00 a.m., July 21	48	40,000	95.6	2328	3,000	102.2	173	5
10.00 a.m., July 24	10.00 a.m., July 26	44.5	37,100	97.6	5140	9,300	127	240	6
10.00 a.m., July 27	5.30 a.m., July 29	55	45,900	98.0	9287	30,000	189.6	900	21
10.00 a.m., Aug. 1	10.00 a.m., Aug 3	48	40,000	95.2	3106	4,700	120	320	6
Averages	.....	50.1	41,750	95.3	3726	.....	132.6	.....	51

Or 20,875,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank "C"—10 Million Gallons per Acre per Day.

Time started.	Time stopped.	Length of run in hours.	Gallons discharged per run.	Average Bact. eff'cy. per run.	Remarks.		
					Raw water count.	Filtered water count.	Weight.
1909							
10.20 a.m., Sep. 15	11.00 a.m., Sep. 20	108.75	90,500	81.2	209.0	39.2	10
4.00 p.m., Sep. 20	2.10 p.m., Sep. 22	46.5	38,750	88.9	224.6	24.8	6
5.30 p.m., Sep. 22	8.30 a.m., Sep. 27	87.0	72,400	99.8	2979.8	8.4	8
12.30 a.m., Sep. 27	5.00 p.m., Sep. 30	76.5	63,750	99.4	717.1	3.7	9
11.05 a.m., Oct. 1	9.45 a.m., Oct. 6	118.25	98,500	92.4	182.6	14.0	13
3.30 p.m., Oct. 6	9.30 a.m., Oct. 14	206.5	172,000	97.9	290.8	5.1	19
12.15 p.m., Oct. 15	3.30 p.m., Oct. 20	124.25	103,200	74.0	318.1	82.5	10
11.15 a.m., Oct. 21	9.00 a.m., Oct. 22	21.75	18,100	96.5	1180.0	41.5	2
3.30 p.m., Oct. 26	5.00 p.m., Nov. 1	121.0	100,800	92.4	71.7	5.4	12
9.30 a.m., Nov. 5	4.00 p.m., Nov. 10	120.0	99,900	93.7	69.5	4.4	10
2.00 a.m., Nov. 11	12.00 a.m., Nov. 15	96.0	80,000	80.6	67.2	13.1	7
2.00 p.m., Nov. 16	3.00 p.m., Nov. 22	145.0	120,800	97.2	280.0	8.0	6
10.00 a.m., Nov. 27	9.30 a.m., Dec. 1	95.5	79,600	93.2	362.0	24.6	5
9.30 a.m., Dec. 3	9.30 a.m., Dec. 7	60.0	49,998	76.8	267.5	62.0	2
Average length of run		101.9					119
" discharge			84,878				
" bact. eff'cy				91.2			
" raw water count					508.5		
" Filtered water count						23.9	

42,439,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank "C"—15 Million Gallons per Acre per Day.

Time started.	Time stopped.	Length of run in hours.	Gallons discharged per run.	Average Bact. Eff'cy. per run.	18° 22° Count. Remarks.				
					Raw.		Filtered.		Weight.
					Aver.	Max.	Aver.	Max.	
1910									
9.30 a.m., Mar. 11	9.00 a.m., Mar. 16	120	150000	61.3	636	1430	246.0	665.0	11
5.00 p.m., Mar. 16	4.00 p.m., Mar. 21	119	148700	84.3	836	3200	131.0	312.0	9
11.00 a.m., April 6	11.00 a.m., April 9	72	90000	64.3	60	240.0	21.4	46.0	9
Averages	.....	103.6	129600	69.4	.....	.....	.....	.....	29

or 64,800,000 gallons per acre per run.

Rate—5 Million Gallons per Acre per Day.

3.45 p.m., May 10	9.30 a.m., May 18	185.75	77400	89.0	89.5	172	9.7	20.0	12
11.00 a.m., May 21	9.30 a.m., May 23	46.5	19400	92.0	147.0	147.0	12.0	12.0	1
10.00 a.m., May 30	11.00 a.m., June 2	73.0	30900	85.5	59.7	100.0	8.6	14.0	8
11.00 a.m., June 4	9.30 a.m., June 6	46.5	19400	99.7	890.0	144.0	2.5	3.0	2
Averages.....	.....	87.9	36.600	88.8	.....	.....	.....	.....	23

or 18,300,000 gallons per acre per run.

Rate—15 Million Gallons per Acre per Day

3.15 p.m., May 6	4.00 p.m., May 9	72.75	90900	82.75	88.5	230	15.5	50.0	6
10.00 a.m., May 26	10.30 a.m., May 28	42.5	53100	86.0	59.5	130.0	8.3	13.0	6
4.00 p.m., June 7	9.30 a.m., June 11	89.5	111800	94.5	129.0	340.0	7.0	20.0	10
4.30 p.m., June 13	12.00 a.m., June 16	67.5	84400	89.7	58.7	110.0	6.0	10.0	8
3.00 p.m., June 17	10.00 am.. June 20	67.0	83800	93.7	72.0	130.0	4.5	7.0	5
9.30 a.m., June 22	10.00 a.m., June 26	84.5	105600	——	44.3	110.0	75.4	160.0	strips
2.00 p.m., June 27	4.00 p.m., June 29	....	.....	.....	26.5	52.0	13.5	43.0	..
10.00 a.m., July 3	4.00 p.m., July 5	54.5	68100	82.6	223.6	430.0	38.8	82.0	6
4.00 p.m., July 6	10.00 a.m., July 9	66.0	82500	92.7	98.0	325.0	7.1	20.0	9
12.00 a.m., July 12	9.30 a.m., July 18	141.5	176900	94.7	92.8	280.0	4.4	10.0	11
4.00 p.m., July 18	10.00 a.m., July 22	90.0	112500	96.5	103.6	170.0	3.7	10.0	10
4.30 .pm., July 22	12.00 a.m., July 23	19.5	24400	95.1	70.0	70.0	3.5	5.0	2
10.00 a.m., July 26	10.00 a.m., July 28	48.0	60000	90.2	143.7	500.0	14.0	54.0	8
4.00 p.m.. July 29	12.00 a.m., July 30	20.0	25000	98.0	350.0	350.0	7.0	7.0	1
2.00 p.m., Aug. 3	10.00 a.m., Aug. 8	116.0	145000	98.2	66.0	181.0	1.1	4.0	7
3.30 p.m., Aug. 9	10.00 a.m., Aug. 13	90.5	113100	96.0	53.3	121.0	2.1	4.0	9
11.30 a.m., Aug. 16	12.00 a.m., Aug. 17	24.5	30600	76.5	34.0	51.0	8.0	9.0	2
Averages	.....	70.0	87.500	92.98	.....	.....	.....	.....	100

or 43,750,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

TANK C.—FIVE MILLION GALLONS PER ACRE PER DAY.

Time started.	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. eff'cy. per run	Remarks				Weight.
					Raw		Filtered		
					Av'ge	Max.	Av'ge	Max.	
1910									
10.00 a.m., Aug. 30	4.00 p m., Sep. 7	198.0	82.500	92.4	252.0	1440	19.2	114.0	19
4.00 p.m., Sep. 8	12.00 a.m., Sep. 24	380.0	158.300	96.3	298.0	2000	11.1	170.0	27
4.00 p.m., Sep. 26	12.00 a.m., Oct. 11	356.0	148.300	97.9	225.3	536.0	5.0	14.0	13
Averages	.....	311.3	129.600	95.4	.....	.....	.....	.....	59

or 64,800,000 Gallons per Acre per run.

RATE—TEN MILLION GALLONS PER ACRE PER DAY.

12.00 a.m., Oct, 13	3.30 p.m., Oct. 21	197.5	164.500	74.7	433.0	1200.	109.6	225.	8
4.00 p.m., Oct. 24	10.30 a.m., Nov. 5	282.5	235.400	27.5	110.5	240.0	80.1	360.	8
11.30 p.m., Nov. 8	10.00 a.m., Nov.14	141.0	117.500	....	.....	.....	.....	.....	....
		Not stopped, rate changed to 3 million—see 3 million							
Averages	.....	206.8	172.259	51.1	.....	.....	.....	.....	16

or 86,125,000 Gallons per Acre per run.

RATE—THREE MILLION GALLONS PER ACRE PER DAY.

10.00 a.m., Nov. 14	12.30 a.m., Dec. 3	461.0	115.200	—	13.7	186.0	237.7	1500.	20
5.00 p.m., Dec. 5	5.00 p.m., Dec. 10	672.	168.000	92.8	66.3	450.0	4.8	12.	13
Averages	.....	566.	141.500	92.8	.....	.....	.....	.....	13

or 70,000,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank C.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. eff'cy. per run	18°–22°C. Remarks. Raw Av'ge.	Raw Max.	Filtered Av'ge	Filtered Max.	Weght
1911									
12.45 a.m., Mar. 25	5.00 p.m., Apr. 7	316.25	131700	70.3	9950	30000	2960	13600	15
1.00 p.m., Apr. 8	1.00 p.m. Apr. 15	168	70000	92.4	18730	29000	1430	3300	11
3.00 p.m., Apr. 18	10.00 p.m., Apr. 24	139	57900	97.3	14410	32700	401	2700	11
10.00 a.m., Apr. 26	10.00 a.m., May 1	120	50000	97.7	4560	7600	105.	290	11
11.50 a.m., May 3	10.00 a.m., May 8	118.5	49400	90.9	1580	4000	145	340	15
9.00 a.m., May 12	9.00 a.m., May 15	72	30000	91.6	41420	110000	3460	6000	5
9.00 a.m., May 17	10.00 a.m., May 19	49	20400	99.1	25250	30000	236	500	6
1.00 p.m., May 23	10.00 a.m., May 26	30	12500	99.8	99039	280000	208	550	5
2.00 p.m., May 30	1.30 a.m., June 1	47.5	19800	99.5	60850	120000	300	400	4
2.30 p.m., June 5	5.00 a.m., June 7	50.5	21000	99.3	35471	136000	239	470	12
10.00 p.m., June 10	12.00 a.m., June 17	159.5	66500	98.5	5970	15000	94.9	190	18
10.30 a.m., June 26	2.00 p.m., June 28	.....	.....	98.4	20416	34000	219.0	420	11
10.30 a.m., June 29	10.00 a.m., June 30	75.5	31200	99.6	266666	300000	980	1430	3
10.00 a.m., July 4	5.00 p.m., July 5	31	12900	95.2	3800	7600	182	520	5
1.00 p.m., July 6	2.00 p.m., July 7	25	10400	94.7	1918	2700	102	200	5
10.00 a.m., July 12	1.00 p.m., July 13	27	11200	80.4	478	1200	93.5	234	4
Averages	.....	95.2	39650	96.1	....,..	....,..	.....	.....	126

Rate—Ten Million Gallons per Acre per Day.

10.30 a.m., July 14	10.00 a.m., July 15	24	20000	97.4	4225.	8000	109.7	176	4
10.20 a.m., July 18	5.00 p.m., July 18	7	5800	9.2	114	282	102.7	300	4
Averages.....	.....	15.5	129000	97.4	.....	.....	.....	.....	4

Rate—Five Million Gallons per Acre per Day.

10.00 a.m., July 19	10.00 a.m., July 24	120	50000	99.3	6600	13500	48.7	103	9
10.00 a.m., July 25	10.00 a.m., July 31	144	60000	99.3	12729	46000	102.4	240	15
10.00 a.m., Aug. 1	4.00 p.m., Aug. 9	198	82800	99.9	42666	200000	61.1	144	12
11.10 a.m., Aug. 10	10.00 a.m., Aug. 11	no hea	d lost	99.3	19875	30000	136.2	280	4
Averages.....	.....	154	64.200	99.5	....,..	....,..	.....	.....	40

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank C.—Five Million Gallons per Acre per Day.

Time Started	Time Stopped	Length of run in hours	Gallons discharged per run	Average bact. effcy. per run	37° C Remarks				Weight
					Raw		Filtered		
					Av'ge.	Max.	Av'ge	Max.	
1911									
12.45 a.m., Mar. 25	5.00 p.m., Apr. 7	316.25	131700	....	2875	7000	695	4200	..
1.00 p.m., Apr. 8	1.00 p.m., Apr. 15	168	70000	98.3	4000	6200	68	242	11
3.00 p.m., Apr. 18	10.00 p.m., Apr. 24	139	57900	99.6	4252	9000	18.5	25	11
10.00 a.m., Apr .26	10.00 a.m., May 1	120	50000	98.7	1192	4000	15.3	30	11
11.50 a.m., May 3	10.00 a.m., May 8	118.5	49400	96.7	598	1420	20	38	15
9.00 a.m., May 12	9.00 a.m., May 15	72	30000	98.7	9040	2200	119	300	5
9.00 a.m., May 17	10.00 a.m., May 19	49	20400	98.6	3300	4800	47	100	6
1.00 p.m., May 23	10.00 a.m., May 26	30	12500	99.8	15213	3600	27.4	40	4
2.00 p.m., May 30	1.30 a.m., June 1	47.5	19800	99.4	8100	10700	50.6	87	4
2.30 p.m., June 5	5.00 a.m., June 7	50.5	21000	98.8	6291	2100	72.4	160	12
10.00 p.m., June 10	12.00 a.m., June 17	159.5	66500	97.5	935	4600	22.5	65	18
10.30 a.m., June 26	2.00 p.m., June 28	.....	.....	99.9	10208	2400	74.5	180	11
10.30 a.m., June 29	10.00 a.m., June 30	75.5	31200	99.4	6033	7000	41.6	50	3
10.00 a.m., July 4	5.00 p.m., July 5	31	12900	98.5	1070	3500	16.4	36	5
1.00 p.m., July 6	2.00 p.m., July 7	25	10400	95.9	582	1200	24	42	5
10.00 a.m., July 12	1.00 p.m., July 13	27	11200	94.2	292	1400	16.8	30	5
Averages	.....	95.2	39.650	98.3	4740	.....	42.2	.....	126

or 19,825,000 gallons per acre per run.

Rate—Ten Million Gallons per Acre per Day.

10.30 a.m., July 14	10.00 a.m., July 15	24	20000	97.5	2000	3500	49.5	84	4
10.20 a.m., July 18	5.00 p.m., July 18	7	5800	—	2.6	4	16.1	102	4
Averages	.....	15.5	12900	97.5	2000	.....	49.5	.....	4

Rate—Five Million Gallons per Acre per Day.

10.00 a.m., July 19	10.00 a.m., July 24	120	50000	99.5	2345	7100	12.2	23	9
10.00 a.m., July 25	10.00 a.m., July 31	144	60000	99.2	6735	30000	52.6	194	15
10.00 a.m., Aug. 1	4.00 p.m., Aug. 9	198	82800	99.6	4322	15000	17.6	26	12
11.10 a.m., Aug. 10	10.00 a.m., Aug. 11	No he	adloss	99.8	6325	10000	16.8	33	4
Averages	.....	154	64.200	99.5	4932	.....	24.8	.....	40

or 32,100,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank D.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. eff'cy. per run	Remarks		
					Raw water count	Filtered water count	Weight
1909							
10.20 a.m., Sep. 15	12.40 a.m., Sep. 23	194.5	80750	72.6	244.4	66.7	20
5.00 p.m., Sep. 23	3.30 p.m., Oct. 1	179.5	74600	99.7	1781.0	3.4	21
10.45 a.m., Oct. 2	11.30 a.m., Oct. 13	252.75	105000	98.0	278.3	5.3	24
11.30 a.m., Oct. 14	9.00 a.m., Oct. 22	177.0	73600	96.4	788.3	28.1	20
4.45 p.m., Oct. 26	5.00 p.m. Nov. 5	204.25	85000	97.1	60.4	1.7	15
1.00 p.m., Nov. 6	9.30 a.m. Nov. 12	140.5	58400	99.6	69.5	0.3	12
10.00 a.m., Nov. 13	3.30 p.m. Nov., 22	221.5	92000	87.2	934.9	120.2	9
1.00 p.m., Nov. 29	9.30 a.m. Dec., 4	116.5	48533	91.4	208.1	17.9	8
4.30 p.m., Dec. 6	9.30 a.m. Dec., 7	17.0	7082	——	——	——	129
Average length of run		167.0					
" discharge			69451				
" bact. eff'cy				95.3	670.4	30.4	
" raw water count					670.4		
" filtered water count						30.4	

34,725 500 gallons per acre per run

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

TANK "D"—12 MILLION GALLONS PER ACRE PER DAY.

Time started.	Time stopped.	Length of run in hours.	Gallons discharged per run.	Average Bact. eff'cy. per run.	18° to 22° Count. Remarks. Raw. Aver.	Raw. Max	Filtered. Av.	Filtered. Max.	No. samples taken.
1910									
4.00 p.m., May 5	9.00 a.m., May 9	89.25	89250	77.5	109.0	222.0	24.5	69.0	6
3.45 p.m., May 10	12.00 a.m., May 14	92.25	92250	84.4	88.3	172.0	13.75	40.0	12
11.00 a.m., May 21	9.30 a.m., May 23	46.50	46500	77.5	147.0	147.0	33.0	33.0	1
10.00 a.m., May 26	10.00 a.m., May 30	96.00	96000	93.8	58.9	130.	3.88	8.	8
11.30 a.m., June 1	11.00 a.m., June 2	23.50	23500	90.3	67.6	100.	6.6	13.	3
12.00 a.m., June 3	9.30 a.m., June 6	69.5	69500	99.6	502.0	1440.	2.3	4.0	3
4.00 p.m., June 6	4.00 p.m., June 8	48.0	48000	94.2	155.0	340.	8.7	15.0	7
10.00 a.m., June 13	10.00 a.m., June 15	48.0	48000	82.3	69.3	110.	12.3	27.	6
5.00 p.m., June 15	11.00 a.m., June 17	42.0	42000	76.3	62.0	84.0	14.7	40.	6
3.00 p.m., June 17	10.00 a.m., June 20	67.0	67000	69.5	72.0	130.	22.0	45.	4
4.00 p.m., June 21	10.00 a.m., June 27	138.0	138000	——	49.9	110.0	52.0	160.0	12
2.00 p.m., June 27	4.00 p.m., June 29	50.0	50000	76.2	26.5	52.0	6.3	18.0	6
10.00 a.m., July 3	4.30 p.m., July 5	54.5	54500	83.0	182.4	430.	31.0	54.0	6
4.10 p.m., July 6	4.00 p.m., July 8	51.0	51000	91.2	98.0	325.0	8.7	48.0	9
12.00 a.m., July 12	9.30 a.m., July 18	139.5	139500	95.9	92.8	280.0	3.8	20.0	11
4.00 p.m., July 18	10.00 a.m. July 22	90.0	90000	93.0	103.8	170.0	7.5	41.0	10
4.30 p.m., July 22	10.00 a.m., July 25	65.5	65000	97.2	70.0	70.0	2.0	3.0	2
12.00 a.m., July 26	10.00 a.m., Aug. 8	308.0	308000	91.8	67.3	500.0	5.5	15.0	21.0
3.30 p.m., Aug. 9	12.00 a.m., Aug. 13	92.5	92500	98.0	53.5	121.0	1.0	3.0	9
11.30 a.m., Aug. 16	10.00 a.m., Aug. 18	46.5	46500	97.0	93.6	137.0	2.66	4.0	3
Averages	.....	84.37	84.370	81.4	.....	.....	.....	.....	133

42,185,000 gallons per acre per run.

RATE 5 MILLION GALLONS PER ACRE PER DAY.

10.00 a.m., Aug. 30	12.30 a.m., Sep. 9	242.5	101000	90.2	215.9	1440	21.3	82.0	25
12.00 a.m., Sep. 12	12.00 a.m., Sep. 26	336.0	138900	97.1	312.0	2000.	9.1	23.	20
2.00 p.m., Sep. 27	12.00 a.m., Oct. 14	406.0	169170	96.4	211.2	590.	7.8	24.	14
Averages	.....	328.16	136,700	94.0	.....	.....	.....	.....	59

68,350,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank D—Ten Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. eff'cy. per run	Remarks				
					Raw		Filtered		No. samples taken
					Av'ge.	Max.	Max.	Av'ge	
1910									
8.00 a.m., Oct. 15	4.00 p.m., Oct. 21	152.0	126690	62.0	546.5	1200	210.8	1000.0	6
4.00 p.m., Oct. 24	12.00 a.m., Nov. 4	260.0	216700	92.2	104.7	240.3	8.2	30.0	9
11.30 a.m., Nov. 8	5.00 p.m., Nov. 9	29.5	24580	52.4	63.0	186.0	30.0	77.0	3
Averages	.....	147.16	122500	87.3	.....	.....	.....	.....	18

61,250,000 gallons per acre per run.

Rate—Three Million Gallons per Acre per Day.

5.00 p.m., Nov. 11	10.00 a.m., Nov. 29	425	106300	....	3.7	12.0	3.64	23.	..
5.00 p.m., Dec. 2	5.00 p.m., Dec. 16	336	84000	96.0	27.1	100.0	1.09	4.	11
5.00 p.m., Dec. 17	5.00 p.m., Jan. 3	No head loss		85.2	12.1	458.1	1.8	6.	5
Averages	.....	380.3	95.100	92.6	.....	.....	.....	.....	16

47,550,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX C.

RUN AVERAGES.

TANK D.—FIVE MILLION GALLONS PER ACRE PER DAY.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average bact. eff'cy. per run	18°–22°C Remarks. Raw. Av'ge.	Raw. Max.	Filtered Av'ge.	Filtered Max.	Weight
1911									
5.00 p.m., Mar. 23	10.00 a.m., Apr. 1	185	77000	89.5	177.1	9600	186.9	530	10
11.00 a.m., Apr. 5	5.30 p.m., Apr. 12	174	72400	81.8	9.1	187	16.6	80	9
3.00 p.m., Apr. 18	10.00 a.m., Apr. 24	137	57000	96.0	185.3	480	7.4	22	11
2.00 p.m., Apr. 25	10.00 a.m., Apr. 29	92	38400	82.6	198.0	360	27.7	155	10
3.30 p.m., May 1	10.00 a.m., May 8	160.5	66800	98.5	580.	3200	8.5	44	12
1.00 p.m., May 11	9.00 a.m., May 15	92	38400	72.4	112.1	185	31.1	128	7
9.00 a.m., May 17	10.00 a.m., May 19	49	20400	98.6	334.1	700	4.5	11	6
12.00 a.m., May 22	1.00 p.m., May 26	97	40400	99.7	5368	30000	11.6	32	6
4.00 p.m., May 29	1.00 p.m., June 6	115.5	48200	98.3	283.2	800	5	16	13
10.00 a.m., June 10	10.00 a.m., June 20	170	70800	98.9	279.7	500	15.4	100	19
10.30 a.m., June 26	12.00 a.m., June 28	29	12100	97.2	324.7	325	6.5	7	4
10.00 a.m., July 3	12.00 a.m., July 5	50	20800	88.8	99.6	300	11.2	45	5
1.00 p.m., July 6	11.30 a.m., July 29	550.5	229300	83.7	153.2	660	25	100	43
4.00 p.m., July 29	10.00 a.m., Aug. 11	306	12700	93.6	150.6	800	9.9	38	24
Averages	.....	157.5	65700	90.7	.....	.....	.....	.....	179

32,850,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

EXPERIMENTAL STATION.

Sand Filters.—Appendix C.

Run Averages.

Tank D.—Five Million Gallons per Acre per Day.

Time started	Time stopped	Length of run in hours	Gallons discharged per run	Average Bact. eff'cy. per run.	37°C. Remarks				Weight
					Raw		Filtered		
					Av'ge.	Max.	Av'ge.	Max.	
1911									
5.00 p.m., Mar. 23	10.00 a.m., Apr. 1	185	77000	57.9	72.1	166	30.4	170	10
11.00 a.m., Apr. 5	5.30 p.m., Apr. 12	174	72400	90.4	37.5	64	3.66	8	9
3.00 p.m., Apr. 18	10.00 a.m., Apr. 24	137	57000	60.3	15.1	25	6	19	10
2.00 p.m., Apr. 25	10.00 a.m., Apr. 29	92	38400	87.2	23.4	40	3	6	9
2.30 p.m., May 1	10.00 a.m., May 8	160.5	66800	92.0	44.8	340	3.6	7	11
1.00 p.m., May 11	9.00 a.m., May 15	92	38400	55.0	9.1	15	4.1	10	6
9.00 a.m., May 17	10.00 a.m., May 19	49	20400	85.2	11.5	25	1.7	7	6
12.00 a.m., May 22	1.00 p.m., May 26	97	40400	89.3	28.1	140	3	5	6
4.00 p.m., May 29	1.00 p.m., June 6	115.5	48200	75.8	9.5	28	263	7	11
10.00 a.m., June 10	10.00 a.m., June 20	170	70800	74.5	10.2	19	2.6	6	18
10.30 a.m., June 26	12.00 a.m., June 28	29	12100	88.7	15	37	1.7	3	4
10.00 a.m., July 3	12.00 a.m., July 5	50	20800	18.7	3.2	9	2.6	4	5
1.00 p.m., July 6	11.30 a.m., July 29	550.5	229300	77.3	13.5	173	3.07	17	44
4.00 p.m., July 29	10.00 a.m., Aug. 11	306	12700	57.7	2.6	16	1.1	4	25
Averages	....., ...	157.5	65700	72.6	.....	.....	.....	.....	174

32,850,000 gallons per acre per run.

Raw water, normally Lake Ontario water. Lagoon water, December, 1910, to July, 1911. Chlorination of Toronto water started April, 1910.

APPENDIX D.

TABLE 1. APPEN

SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.		Hour.		Serial No.	Bacterial Counts.					
		A.M.	P.M		18°-22°C.		37.5°C.		Influent.	
					Inf.	Eff.	Inf.	Eff.	1 C.C.	5 C.C.
	1912									
Feb.	21	12.00				36		1	0	
	23	10.00			1	43	—	—		
		12.00			5	41	0	1		
	24	11.00			3	41	0	6		
			1.00		1	62	2	7		
	27	12.00			100	92	61	51		
	28	11.00			1	71	5	2		
	29	11.00			16	63	4	4	0	0
Mar.	1	11.00			2	80	3	4		
	2	11.00			2	97	0	0		
	8		3.30		1	50	0	1		
			4.00			45	1	1		
	9		4.00		2	10	1	0		
		11.00			3	60	2	0		
	11		5.00		6	38	2	2		
	13		4.00		10	42	3	10		
	14	12.00			—	3	1	2		
	15		4.00		4	32	6	0		
			4.30			30		—		
May	30	10.30			44	1,987	4	2		
		10.30				43		—		
			2.30		288	21	1	3		
			2.30			23		1		
	31		2.30		992	22	1	—		
June	1	11.00			183	4	5	6		
	3	11.00			211	8	6	6		
			2.00		312	13	4	3		
			4.00		120	1	3	1		
	4	9.00			—	7	—	4		
	5	11.30			50	15	2	1		
	8	10.30			224	14	82	—		
	11		3.30		120	8	5	0		
			3.30			73		3		
	12		6.00		120	12	0	6		
	13		5.00		195	136	11	12		
	15	11.30			90	53	120	25		
		11.30				54		—		
	18	12.00			10	18	2	6		
		12.00				8		1		
	19	10.00			11	3	2	2		
		12.00			3	0	1	1		
			5.00		15	15	1	3		
			6.00			12		2		
	20	10.00					2	1		
			1.00		6	4	0	6		
			3.00		42		5	1		
			3.15			3	2	1		
			3.30		5	3	5	2		
			3.45		3	3	3	1		
			4.00		6	4	3			
			4.15		1	3	1	2		
			4.30		1	2	1	3		
			4.45		7	8	4	0		

DIX D.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	+	0	+
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	+	+	+
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	0	.....	0	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	+	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
.....	.....	0	.....	.....	00	.....	.....	.....	.....	.....	0	0	0
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.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	0	0
.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	0	0
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.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	0	0
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	D	D											
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.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	.....	.....	—+
.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	.....	.....	00
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.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00
.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00
.....	.....	.....	.....	.....	.....	.....	.....	0	.....	0	.....	.....	00
.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00
.....	0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00
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.....	0	0	.....	00	.....	.....	.....	0	.....	0	.....	.....	00
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.....	0	0	.....	00	.....	.....	.....	0	.....	0	.....	.....	50
.....	0	0	.....	00	.....	.....	.....	0	.....	0	.....	.....	00
.....	0	0	.....	00	.....	.....	.....	0	.....	0	.....	.....	00
.....	0	0	.....	00	.....	.....	.....	0	.....	0	.....	.....	00

TABLE 1. APPENDIX D—SAND

EXPERIMENTAL STATION. TANK "B"—RATE 5,000,000 GALLONS

Date.	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°–22°C Inf	18°–22°C Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent 1 C.C.	Influent 5 C.C.	Influent 10 C.C.
1912										
	.....	5.00	.....	11	4	4	1	.....	.....	.....
June 21....	9.30	11.00	.....	.....	.....	.....	.....	.....	.....	.....
	11.00	.....	.....	.....	.....	.....	2	.....	.....	.....
	12.00	.....	.....	6	12	0	1	.....	.....	.....
	.....	3.30	.....	12	12	4	2	.....	.....	.....
21....	.....	4.00	.....	45	7	0	2	.....	.....	.....
	.....	4.15	.....	35	13	0	0	.....	.....	.....
	.....	4.30	.....	45	14	1	0	.....	.....	.....
	.....	5.00	.....	20	7	5	1	.....	.....	.....
22....	10.00	.....	.....	11	9	0	1	.....	.....	.....
	.....	12.00	.....	36	9	0	0	.....	.....	.....
	.....	1.00	.....	87	6	2	2	.....	.....	.....
24....	10.00	.....	.....	.....	8	2	4	.....	.....	.....
	11.55	.....	.....	.....	.....	.....	.....	.....	.....	.....
	12.00	.....	.....	46	12	8	5	.....	.....	+
	12.15	.....	.....	500	18	330	4	.....	.....	+
	12.30	.....	.....	600	12	390	5	.....	.....	+
	12.45	.....	.....	800	11	440	2	+	—	.....
	.....	1.00	.....	880	11	440	3	+	+	.....
	.....	1.15	.....	820	6	480	4	+	+	.....
								.01 C.C.	.02 C.C.	.05 C.C.
	.....	1.30	.....	960	12	480	—	.....	.....	+
	.....	1.45	.....	2,400	13	800	13	+	+ G	—
	.....	2.00	.....	2,200	52	1,270	18	0	—	—
	.....	2.15	.....	4,500	100	1,440	60	+	+	+
	.....	2.30	.....	3,700	160	1,200	116	0	0	—
	.....	2.45	.....	3,700	220	1,480	140	.....	.....	—
	.....	3.00	.....	2,400	172	1,550	116	.....	0	—
	.....	3.15	.....	3,300	230	2,140	130	+	+	+
	.....	3.30	.....	3.000	200	2,400	140	0	+	—
	.....	3.45	.....	1,000	300	600	220	0	0	0
	.....	4.00	.....	420	370	400	225	0	—	—
	.....	4.15	.....	—	370	170	230	0	0	0
								.01 C.C.	.02 C.C.	.05 C.C.
	.....	4.30	.....	1,100	380	300	161	0	0	0
	.....	4.45	.....	1,200	300	150	170	0	0	+
	.....	5.00	.....	1.000	450	200	230	.....	.....	.....
	.....	5.15	.....	700	315	250	240	0	0	0
	.....	5.30	.....	2,100	380	700	220	0	+	+
	.....	5.55	.....	470	330	.....	200	0	0	0
	.....	7.30	.....	900	290	300	232	0	0	0
								1 C.C.	5 C.C.	10 C.C.
25....	.....	3.30	.....	34	22	2	0	0	0	0
	.....	4.00	.....	360	33	5	1	0	0	0
	.....	4.30	.....	115	21	1	3	0	0	0
26....	10.00	.....	.....	13	15	2	2	0	0	0
	12.00	.....	.....	100	17	.....	1	0	0	0
27....	12.00	.....	.....	8	24	6	7	0	0	0
	12.30	.....	.....	14	21	4	0	0	0	0

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli

Influent.					Effluent.								
15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	
0	0	.....	00	.....	.....	0	0	.....	0	.....	.....	00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00	.....
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0	0	.....	.....	00	.....	.....	0	.....	0	.....	.....	00	.....
0	0	.....	.....	00	0	.....	0	.....	0	.....	.....	00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	+	.....	.....	++	0	.....	0	.....	0	.....	.....	00	.....
.....	+	.....	.....	+	0	.....	0	.....	0	.....	.....	00	.....
.....	+	.....	.....	+	0	.....	0	.....	0	.....	.....	00	.....
+	+	.....	.....	.....	0	.....	0	.....	0	.....	.....	00	.....
+	+	.....	.....	.....	0	.....	0	.....	0	.....	.....	00	.....
+	+	.....	.....	.....	0	.....	0	.....	0	.....	.....	.....	.....
.1 C.C.	1 C.C.	5 C.C.	10 C.C.										
+	+	+	.....	.....	0	.....	0	.....	0	.....	.....	— —	.....
+	+	+	.....	.....	.....	.....	+	.....	+	.....	.....	++	.....
+	+	+	.....	.....	.....	.....	+	.....	+	.....	.....	++	.....
+	+	+	.....	.....	+	+	+	.....	+	.....	.....	++	.....
+	+	+	.....	.....	+	+	+	.....	+	.....	.....	++	.....
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	$\frac{1}{10}$cc + G
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	—
+	+	+	.....	.....	+	+	+	.....	+	.....	.....	.....	0
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	0 G
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	—
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	+
0	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	0
.1 C.C.	5 C.C.	10 C.C.											
0	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	+
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	+
					—								—
0	+	+	.....	.....	+	+	.....	.....	.....	.....	.....	.....	—
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	.....	—
0	+	+	.....	.....	+	.....	.....	.....	.....	.....	.....	.....	0
+	+	+	.....	.....	+	+	+	.....	.....	.....	.....	++	0
15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.									
.....	0	.....	.....	00	0	+	+	.....	+	.....	.....	++	.....
.....	0	.....	.....	00	0	+	+	.....	+	.....	.....	++	.....
.....	0	.....	.....	00	0	+	+	.....	+	.....	.....	++	.....
.....	0	.....	.....	00	0	+	+	.....	+	.....	.....	++	.....
.....	0	.....	.....	00	0	+	+	.....	+	.....	.....	++	.....
.....	0	.....	.....	.....	0	0	+	.....	+	.....	.....	+	.....
.....	0	.....	.....	.....	0	0	+	.....	+	.....	.....	+	.....

TABLE 1. APPENDIX D—SAND

EXPERIMENTAL STATION. TANK "B"—RATE 5,000,000 GALLONS

Date	Hour. A.M.	Hour. P.M.	Serial No.	Bacterial Counts. 18°-22°C, Inf.	18°-22°C, Eff.	37.5°C. Inf.	37.5°C. Eff.	Influent 1 C.C.	Influent 5 C.C.	Influent 10 C.C.
1912										
June 27....	.....	6.00	.....	80	5	3	0	0	0	0
28....	10.00	.....	.....	44	65	—	2	.....	.....	.....
	10.30	.....	.....	.....		.....	2	.....	.....	.....
	11.00	.....	.....	.....	56	.....	2	.....	.....	.....
	11.30	.....	.....	.....	56	.....	2	.....	.....	.....
	12.00	.....	.....	180	36	2	3	0	0	0
	.....	2.30	.....	.....	24	.....	2	.....	.....	.....
	.....	3.00	.....	.....	40	.....	3	.....	.....	.....
	.....	3.30	.....	.....	46	.....		.....	.....	.....
	.....	4.00	.....	.....	62	.....	2	.....	.....	.....
	.....	4.30	.....	.....	40	.....	2	.....	.....	.....
	.....	5.00	.....	90		3	0	0	0	0
29....	10.00	.....	.....	86	63	3	2	0	0	0
	11.00	.....	.....	60	47	5	3	0	0	0
	12.00	.....	.....	170			6	0	0	0

TABLE 2. TANK "B"—RATE 5,000,000 GALLONS

Date.	Hour. Noon.	Guage No.	Depth to Gauge	Bacterial Counts. 18°. 22° C Inf.	18°. 22° C Eff.	37.5° C Inf.	37.5° C Eff.	Influent. 1 C.C.	Influent. 5 C.C.
1912									
June 27.....	12.00	Top	.....	8	.....	6	.....	0	0
	12.30	"	.....	14	.....	4	.....	0	0
"	12.00	1	6 in. sand	.....	33	.....	4	.....	.....
	12.30	"	.....	.....	30	.....	11	.....	.....
"	12.00	2	13 in. sand	.....	30	.....	8	.....	.....
	12.30	"	.....	.....	34	.....	3	.....	.....
"	12.00	3	19 in. sand	.....	21	.....	2	.....	.....
	12.30	"	.....	.....	26	.....	5	.....	.....
"	12.00	4	26 in. sand	.....	22	.....	3	.....	.....
	12.30	"	.....	.....	40	.....	1	.....	.....
"	12.00	5	33 in. sand	.....	19	.....	4	.....	.....
	12.30	"	.....	.....	20	.....	3	.....	.....
"	12.00	6	40 in. sand	.....	43	.....	3	.....	.....
	12.30	"	.....	.....	33	.....	4	.....	.....
"	12.00	orifice	under drains	.....	24	.....	7	.....	.....
	12.30	box	.....	.....	21	.....	0	.....	.....

Colon present from dose of sewage

Continued.

FILTERS.

PER ACRE PER DAY.

Colon Bacilli.

Influent.						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
.....	0	.....	.....	.....	0	0	+	.....	+	.....	.....	+	.....
.....	0	.....	.....	0	0	0	0	.....	+	0	.....	+	.....
.....	.....	.....	.....	.....	0	0	0	.....	0	0	.....	+	.....
.....	.....	.....	.....	.....	0	0	+	.....	+	+	.....	+	.....
.....	.....	.....	.....	.....	0	0	0	.....	+	+	.....	+	.....
.....	0	.....	.....	0	0	+	0	.....	0	+	.....	+	.....
.....	.....	.....	.....	.....	0	0	0	.....	+	0	.....	+	.....
							G						
.....	.....	.....	.....	.....	0	+	—	.....	0	+	.....	+	.....
.....	.....	.....	.....	.....	0	0	0	.....	0	+	.....	+	.....
.....	.....	.....	.....	.....	0	0	0	.....	+	+	.....	+	.....
												G	
.....	.....	.....	.....	.....	0	0	+	.....	0	+	.....	—	.....
.....	0	.....	.....	0	0	0	+	.....	+	+	.....	+	.....
.....	0	.....	.....	0	0	0	0	.....	+	0	.....	+	.....
.....	0	.....	.....	0	0	0	0	.....	+	+	.....	+	.....
.....	0	.....	.....	0	0	0	0	.....	0	0	.....	0	.....

PER ACRE PER DAY. "INTERNAL COUNTS."

Colon Bacilli.

Influent						Effluent.							
10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.	1 C.C.	5 C.C.	10 C.C.	15 C.C.	20 C.C.	30 C.C.	40 C.C.	50 C.C.
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
0	.....	.....	0	.....	0	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	0	.....	0
.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	+	+	+
.....	.....	.....	.....	.....	.....	0	0	0	.....	.....	+	.....	+
.....	.....	.....	.....	.....	.....	0	+	0	.....	.....	0	.....	+
.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	+	.....	+
.....	.....	.....	.....	.....	.....	0	+	+	.....	.....	+	+	+
.....	.....	.....	.....	.....	.....	0	+	0	.....	.....	+	.....	+
.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	+	+	+
.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	+	.....	+

added at noon, June 24th, 1912.

TABLE 3. APPENDIX D—

SAND

TANK "B"—RATE 5,000,000 GALLONS

EXPERIMENTAL STATION.

Date.	Hour. P.M.	Gauge No.	Depth to Gauge.	Bacterial Counts. 18°. 22°C Inf.	18°. 22°C Eff.	37.5° C Inf.	37.5° C Eff.	Influent. 1 C.C.	Influent. 2 C.C.
1912									
July 2.....	5.15	1	6 in. sand	850	584	640	50	.....	.....
	6.00	"	.....	4,300	1,950	1,360	130	.....	.....
	7.30	"	.....	6,100	sp.	1,900	sp.	.....	.....
	10.00	"	.....	—	680	1,600	165	.....	.....
	5.15	2	13 in. sand	.....	194	.....	18	.....	.....
	6.00	"	.....	.....	125	.....	—	.....	.....
	7.30	"	.....	.....	1,750	.....	sp.	.....	.....
	10.00	"	.....	.....	860	.....	240	.....	.....
	5.15	3	19 in. sand	.....	103	.....	10	.....	.....
	6.00	"	.....	.....	1,400	.....	145	.....	.....
	7.30	"	.....	.....	904	.....	270	.....	.....
	10.00	"	.....	.....	442	.....	100	.....	.....
	5.15	4	26 in. sand	.....	156	.....	2	.....	.....
	6.00	"	.....	.....	359	.....	30	.....	.....
	7.30	"	.....	.....	2,170	.....	180	.....	.....
	10.00	"	.....	.....	580	.....	96	.....	.....
	5.15	5	33 in. sand	.....	86	.....	19	.....	.....
	6.00	"	.....	.....	480	.....	52	.....	.....
	7.30	"	.....	.....	1,260	.....	260	.....	.....
	10.00	"	.....	.....	660	.....	83	.....	.....
	5.15	6	40 in. sand	.....	88	.....	16	.....	.....
	6.00	"	.....	.....	120	.....	10	.....	.....
	7.30	"	.....	.....	105	.....	—	.....	.....
	10.00	"	.....	.....	380	.....	spreader	.....	.....
	5.15	orifice box		850	138	640	3	.....	.....
	6.00	"	.....	4,300	372	1,360	3	.....	.....
	7.30	"	.....	6,100	1,080	1,900	230	.....	.....
	10.00	"	.....	—	880	1,600	375	.....	.....

Started to add sewage at 4.45 p.m.

1-100c.c. 1-50c.c. relates to two analysis immediately

Continued.

FILTERS.

PER ACRE PER DAY. "INTERNAL COUNTS."

Colon Bacilli.

Influent.						Effluent.							
10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c.	1 c.c.	5 c.c.	10 c.c.	15 c.c.	20 c.c.	30 c.c.	40 c.c.	50 c.c.
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	—
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
						1-100c.c.	1-50c.c.	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	0	0	0	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	0	—	—	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
						1-100	1-50	1-10	1	5	10	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	—	—	—	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
						1-100	1-50	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	0	0	0	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	0	—	—	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	.....	0	.....	.....	0
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
						1-100	1-50	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	0	0	—	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	0	0	.....	+	.....	.....	+
.....	.....	.....	.....	.....	.....	+	+	+	.....	+	.....	.....	+
						1-100	1-50	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	0	—	+	+	+	+	.....	.....
.....	.....	.....	.....	.....	.....	0	0	—	+	+	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	0	—	.....	+	.....	.....	+
.....	.....	.....	.....	.....	.....	0	—	0	.....	.....	.....	.....	
						1-100	1-50	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	0	0	0	+	0	0		
.....	.....	.....	.....	.....	.....	0	—	+	+	+	.....	.....	.....
						—							
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	0	+	+	.....	.....	+	.....	+
						1-100	1-50	1-10	1	5	10		
.....	.....	.....	.....	.....	.....	+	+	+	+	+	—	.....	.....
.....	.....	.....	.....	.....	.....	—	—	+	+	+	.....	.....	.....

stopped adding at 7.30 p.m.

following next set use heading of page 1c.c., 2c.c., etc.

APPENDIX E.

EXPERIMENTAL STATION.
SAND FILTERS.—APPENDIX E.
LOSS OF HEAD AND HOURS RUN.

Date and hour		Tank A		Tank B		Tank C		Tank D		Remarks
		Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
	1909									
Sep.	15..10.20..	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
"	16..10.20..	2.45	24.0	1.95	24.0	1.35	24.0	0.61	24.0	
"	17..10.15..	4.25	48.0	3.0	48.0	.....	.....	0.8	48.0	
	4.15..	0.0	0.0	3.3	54.0	1.9	42.0	.....	.....	
	4.30..	2.5	0.25	.....	.....	.....	.....	.....	.....	
"	18.. 9.30..	2.35	17.25	.....	.....	.....	.....	0.9	71.25	
	11.45..	.....	.....	0.0	0.0	.....	.....	.....	.....	
	12.00..	.....	.....	1.9	0.25	2.2	61.75	.....	.....	
"	20..11.00..	3.3	67.75	3.15	47.25	3.3	108.75	1.5	120.75	
	4.00..	0.0	0.0	3.3	52.25	0.0	0.0	.....	.....	
"	21.. 9.30..	3.3	17.5	.....	.....	.....	.....	2.0	143.25	
	11.45..	.....	.....	0.0	0.0	.....	.....	.....	.....	
	3.00..	0.0	0.0	1.8	4.25	2.1	23.0	.....	.....	
"	22.. 9.20..	2.55	18.5	2.15	19.75	2.15	41.5	2.3	167.25	
	2.15..	.....	.....	.....	.....	3.3	46.5	.....	.....	
"	23.. 9.30..	3.3	42.5	3.3	43.75	.....	.....	2.95	191.25	
	12.45..	0.0	0.0	1.9	0.0	.....	.....	3.3	194.5	
	1.00..	2.2	0.75	.....	.....	.....	.....	.....	.....	
	5.00..	.....	.....	.....	.....	.....	.....	0.0	0.0	
	5.30..	.....	.....	.....	.....	0.0	0.0	.....	.....	
"	24.. 9.30..	2.15	21.25	1.45	20.5	2.0	16.0	0.7	16.5	
"	25.. 9.30..	3.0	45.25	2.05	44.5	2.2	40.0	0.65	40.5	
	11.30..	3.3	47.25	.....	.....	.....	.....	.....	.....	
	3.30..	0.0	0.0	.....	.....	.....	.....	.....	.....	
"	27.. 8.30..	.....	.....	3.3	111.5	3.3	87.0	.....	.....	
	12.00..	.....	.....	.....	.....	.....	.....	1.0	90.5	
	12.30..	.....	.....	0.0	0.0	0.0	0.0	.....	.....	
	1.00..	2.9	45.5	2.0	0.5	1.9	0.5	.....	.....	
	3.00..	3.2	47.5	1.8	2.5	.....	.....	1.0	93.5	
"	28.. 9.30..	0.0	0.0	1.8	21.0	2.1	21.0	1.25	102.0	
"	29.. 9.30..	.....	.....	.....	.....	2.1	45.0	.....	.....	
	4.00..	28.5	30.5	3.1	51.5	.....	.....	1.8	132.5	
	4.30..	.....	.....	3.3	52.0	.....	.....	.....	.....	
"	30.. 9.30..	3.3	48.0	.....	.....	3.0	69.0	2.25	150.0	
	5.00..	.....	.....	.....	.....	3.3	76.5	.....	.....	
Oct.	1.. 3.00..	.....	.....	.....	.....	.....	.....	3.15	179.5	
"	30.. 2.50..	0.0	0.0	0.0	0.0	.....	.....	.....	.....	
"	1..11.05..	.....	.....	.....	.....	0.0	0.0	.....	.....	
	.. 3.00..	3.0	0.25	3.0	0.25	1.8	4.0	.....	.....	
"	2..10.45..	.....	.....	.....	.....	.....	.....	0.0	0.0	
	10.50..	3.3	20.0	.....	.....	.....	.....	.....	.....	
	12.00..	.....	.....	2.6	21.25	1.6	25.0	1.0	1.25	
	1.00..	0.0	0.0	.....	.....	.....	.....	.....	.....	
"	4.. 9.30..	.....	.....	3.3	66.75	.....	.....	.....	.....	
	12.00..	3.3	47.0	.....	.....	.....	.....	.....	.....	
	3.00..	.....	.....	0.0	0.0	.....	.....	.....	.....	
	4.00..	.....	.....	2.4	1.0	2.0	76.5	0.9	52.25	
	4.45..	0.0	0.0	.....	.....	.....	.....	.....	.....	
"	5.. 9.30..	2.15	16.75	2.1	18.5	2.5	94.0	0.9	69.75	
	12.00..	2.25	19.25	3.05	21.0	2.5	96.5	0.9	71.25	
	4.00..	2.15	23.25	2.4	25.0	2.65	100.5	1.0	75.25	
"	6.. 9.30..	2.1	40.75	18.5	42.5	3.3	118.0	1.0	92.75	
	9.45..	.....	.....	.....	.....	3.3	118.25	.....	.....	
	12.00..	2.1	43.25	2.05	45.0	.....	.....	1.1	95.25	
	3.30..	.....	.....	.....	.....	0.0	0.0	.....	.....	
	4.00..	2.3	47.25	1.85	49.0	1.55	0.5	1.5	99.25	
"	7.. 9.30..	2.9	64.75	2.3	66.5	1.5	18.0	1.25	116.75	
	12.00..	3.0	67.25	2.4	69.0	1.5	20.5	.....	.....	
	3.00..	3.3	70.25	.....	.....	.....	.....	.....	.....	
	4.00..	.....	.....	2.50	73.0	1.4	24.5	1.3	123.25	

EXPERIMENTAL STATION.

Sand Filters.—Appendix E.

Loss of Head and Hours Run.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1909									
Oct. 8.. 9.20..	.....	.....	3.0	90.5	1.3	42.0	1.5	140.75	
10.15..	0.0	0.0	.....	.....	.....	.....	.....	.....	
12.00..	2.9	1.75	3.2	93.0	1.3	44.5	1.5	143.25	
12.45..	.....	.....	3.3	93.75	.....	.....	.....	.....	
4.00..	2.75	5.75	.....	.....	1.3	48.5	1.55	147.25	
5.00..	.....	.....	0.0	0.0	.....	.....	.....	.....	
" 9.. 9.30..	2.3	23.25	2.1	16.5	1.3	66.0	1.8	164.75	
12.00..	2.85	25.75	2.1	19.0	1.3	68.5	1.8	167.25	
" 11.. 9.30..	2.75	71.25	1.9	64.5	1.75	134.0	2.4	212.75	
12.00..	2.85	73.75	2.0	67.0	1.8	136.5	2.45	215.25	
4.00..	3.05	77.75	1.9	71.0	1.8	140.5	2.6	219.25	
" 12.. 7.00..	3.3	92.75	.....	.....	.....	.....	.....	.....	
9.30..	.....	.....	2.25	88.5	2.05	158.0	2.9	236.75	
12.00..	.....	.....	2.3	91.0	2.1	160.5	2.95	239.25	
12.45..	0.0	0.0	.....	.....	.....	.....	.....	.....	
4.00..	2.2	4.25	2.4	95.0	2.25	164.25	2.9	243.25	
" 13.. 9.30..	1.9	21.75	3.0	112.5	2.7	182.5	3.2	250.75	
11.30..	.....	.....	.....	.....	.....	.....	3.3	252.75	
12.00..	1.9	24.25	3.1	115.0	2.8	185.0	.....	.....	
4.00..	1.8	28.25	3.25	119.0	2.9	189.0	.....	.....	
" 14.. 9.30..	2.0	45.75	4.25	136.5	4.25	206.5	.....	.....	
11.30..	.....	.....	.....	.....	.....	.....	0.0	0.0	
12.00..	2.05	48.25	.....	.....	.....	.....	.....	.....	
4.00..	2.1	52.25	.....	.....	.....	.....	1.0	4.5	
" 15.. 9.30..	2.5	69.75	.....	.....	.....	.....	0.8	22.0	
12.00..	2.7	72.25	.....	.....	.....	.....	0.8	24.5	
12.15..	.....	.....	0.0	0.0	0.0	0.0	.....	.....	
4.00..	3.1	76.25	2.2	3.75	1.6	3.75	0.8	28.5	
5.00..	3.3	77.25	.....	.....	.....	.....	.....	.....	
" 16.. 9.30..	.....	.....	1.9	21.25	1.5	21.25	0.8	46.0	
12.00..	.....	.....	1.7	23.75	1.5	23.75	0.8	48.5	
12.30..	0.0	0.0	.....	.....	.....	.....	.....	.....	
" 18..10.30..	2.6	44.5	2.2	70.25	1.5	70.25	0.8	83.0	
12.00..	2.7	48.0	2.25	71.75	1.6	71.75	0.8	84.5	
3.30..	2.7	51.5	2.4	75.25	1.6	75.25	0.8	88.0	
" 19.. 9.30..	3.6	69.5	3.15	93.25	2.0	93.25	1.0	106.0	
10.45..	.....	.....	3.3	95.0	.....	.....	.....	.....	
3.30..	0.0	0.0	0.0	0.0	.....	.....	.....	.....	
4.00..	3.0	0.5	.....	0.5	2.1	100.75	1.0	112.5	
" 20 9.30..	2.15	18.0	0.0	0.0	2.6	118.25	1.1	129.5	
12.00..	2.15	20.5	1.8	2.5	2.75	120.75	1.15	132.0	
3.30..	.....	.....	.....	.....	3.3	124.25	.....	.....	
4.00..	2.35	24.5	2.0	6.5	.....	.....	1.5	136.0	
" 21.. 9.30..	3.7	41.5	2.8	24.0	.....	.....	1.8	153.5	
11.15..	.....	.....	.....	.....	0.0	0.0	.....	.....	
12.00..	.....	.....	3.3	26.5	1.9	0.75	1.8	156.0	
1.00..	.....	.....	3.3	27.5	.....	.....	.....	.....	
3.45..	0.0	0.0	.....	.....	.....	.....	.....	.....	
4.00..	2.5	0.25	.....	.....	1.8	4.75	1.9	160.0	
4.30..	.....	.....	0.0	0.0	.....	.....	.....	.....	
" 22.. 9.00..	3.3	17.25	3.3	16.5	3.3	21.75	3.3	177.0	
" 26.. 3.30..	0.0	0.0	0.0	0.0	0.0	0.0	.....	.....	
4.00..	2.9	0.5	2.9	0.5	2.1	0.5	.....	.....	
4.45..	.....	.....	.....	.....	.....	.....	0.0	0.0	
" 27.. 9.30..	2.4	18.0	2.15	18.0	1.5	18.0	0.9	16.75	
12.00..	2.3	20.5	2.1	20.5	1.35	20.5	0.9	19.25	
4.00..	2.2	24.5	2.1	24.5	1.3	24.5	0.9	23.25	
" 28..12.00..	2.2	44.5	1.6	44.5	1.1	44.5	0.9	43.25	
4.00..	2.35	48.5	1.7	48.5	1.1	48.5	0.8	47.25	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total Loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1909									
Oct. 29.. 3.00..	3.15	59.5	2.1	71.5	1.2	71.5	0.8	70.25	
" 30.. 9.30..	.....	.....	2.8	90.0	1.4	89.5	0.9	88.75	
12.00..	0.0	0.0	3.1	92.5	1.5	92.0	0.9	91.25	
Nov. 1.. 9.30..	2.2	21.5	.....	.....	2.5	113.5	1.3	112.75	
11.30..	.....	.....	0.0	0.0	.....	.....	.....	.....	
12.00..	2.35	24.0	2.5	0.5	3.0	116.0	1.6	115.25	
3.00..	2.6	27.0	2.6	3.5	3.0	119.0	1.6	118.25	
5.00..	.....	.....	.....	.....	3.3	121.0	.....	.....	
" 2..10.00..	3.3	44.0	.....	.....	.....	.....	.....	.....	
" 3.. 4.00..	.....	.....	2.0	26.5	.....	.....	2.55	155.25	
" 5.. 9.30..	0.0	0.0	2.5	68.0	0.0	0.0	3.0	196.75	
12.00..	2.6	2.5	2.6	70.5	1.5	2.5	3.1	199.25	
3.00..	2.55	5.5	2.65	73.5	1.4	5.5	3.15	202.25	
5.00..	.....	.....	.....	.....	.....	.....	3.3	204.25	
" 6.. 9.30..	1.8	24.0	3.3	92.0	1.15	24.0	.....	.....	
10.00..	.....	.....	3.3	92.5	.....	.....	.....	.....	
12.00..	1.8	26.5	.....	.....	1.1	26.5	.....	.....	
1.00..	.....	.....	0.0	0.0	.....	.....	0.0	0.0	
" 8..12.00..	2.7	74.5	1.6	47.0	1.0	74.5	0.7	47.0	
4.00..	3.0	78.5	1.7	51.0	1.1	78.5	0.7	51.0	
" 9.. 9.30..	3.3	96.0	.....	.....	.....	.....	.....	.....	
10.00..	.....	.....	2.1	69.0	1.4	96.5	0.7	69.0	
12.00..	.....	.....	2.2	71.0	1.5	98.5	0.7	71.0	
3.45..	0.0	0.0	.....	.....	.....	.....	.....	.....	
4.00..	2.8	0.25	2.6	75.0	1.7	102.5	0.7	75.0	
" 10.. 9.30..	3.3	17.75	3.3	92.5	3.3	120.0	1.3	92.5	
12.00..	.....	.....	.....	.....	.....	.....	1.4	95.0	
3.00..	0.0	0.0	.....	.....	.....	.....	.....	.....	
4.00..	3.0	1.0	.....	.....	.....	.....	1.6	99.0	
" 11.. 9.30..	2.8	18.5	.....	.....	.....	.....	2.4	116.5	
12.00..	3.05	21.0	0.0	0.0	0.0	0.0	2.65	119.0	
3.30..	3.6	24.5	2.4	3.5	1.7	3.5	2.8	122.5	
4.00..	3.6	25.0	.....	.....	.....	.....	.....	.....	
" 12.. 9.30..	.....	.....	2.3	21.5	1.4	21.5	3.5	140.5	
12.00..	0.0	0.0	.....	.....	.....	.....	.....	.....	
3.00..	2.6	3.0	2.3	27.0	1.5	27.0	.....	.....	
" 13.. 9.30..	2.05	21.5	2.8	45.5	1.6	45.5	.....	.....	
10.00..	.....	.....	.....	.....	.....	.....	0.0	0.0	
12.00..	2.2	24.0	2.9	48.0	1.7	48.0	0.9	2.0	
1.00..	.....	.....	3.3	49.0	.....	.....	.....	.....	
" 15.. 9.30..	3.3	45.5	.....	.....	3.2	93.5	0.8	47.5	
12.00..	.....	.....	.....	.....	3.3	96.0	0.8	50.0	
4.00..	.....	.....	.....	.....	.....	.....	0.9	54.0	
" 16.. 9.30..	.....	.....	.....	.....	.....	.....	0.9	71.5	
2.00..	.....	.....	0.0	0.0	0.0	0.0	.....	.....	
3.30..	.....	.....	2.3	1.5	1.5	1.5	0.8	77.5	
" 17..12.00..	.....	.....	1.2	22.0	1.5	22.0	2.2	98.0	
4.00..	.....	.....	2.3	26.0	1.5	26.0	1.45	102.0	
" 18.. 9.30..	.....	.....	3.25	43.5	1.8	43.5	1.8	119.5	
10.00..	.....	.....	3.3	44.0	.....	.....	.....	.....	
12.00..	.....	.....	.....	.....	1.8	46.0	1.8	122.0	
4.00..	.....	.....	.....	.....	1.9	50.0	1.85	126.0	
" 19.. 9.30..	.....	.....	0.0	0.0	2.1	67.5	2.1	143.5	
12.00..	.....	.....	2.1	2.5	2.2	70.0	2.1	146.0	
" 22 3.00..	.....	.....	.....	.....	3.3	145.0	3.35	221.5	
3.30..	.....	.....	2.1	78.0	.....	.....	.....	.....	
" 23.. 9.00..	0.0	0.0	3.3	94.5	.....	.....	.....	.....	Tank A at 5 mill rate.
10.00..	0.8	0.25	.....	.....	.....	.....	.....	.....	
12.00..	0.8	2.25	.....	.....	.....	.....	.....	.....	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour		Tank A		Tank B		Tank C		Tank D		Remarks
		Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
	1910.									
Nov	23.. 3.30..	0.8	5.75	.....	.....	.....	.....	.....	.....	
"	24.. 9.30..	0.7	23.75	.....	.....	.....	.....	.....	.....	
	3.30..	1.3	29.75	.....	.....	.....	.....	.....	.....	
"	27 10.00..	.....	.....	0.0	0.0	0.0	0.0	.....	.....	
Mar.	8..10.00..	.....	.....	2.2	0	3.7	.....	3.7	.....	
	12.00..	.....	.....	2.1	2	.....	.....	.....	.....	
	4.00..	.....	.....	2.1	6	.....	.....	.....	.....	
"	9..10.00..	1.2	0	1.8	24	3.5	.....	.....	.....	
	12.00..	1.2	2	1.8	26	.....	.....	.....	.....	
	4.00..	1.0	6	1.6	30	.....	.....	.....	.....	
"	10..10.00..	1.0	24	1.6	48	.....	.....	.....	.....	
	12.00..	1.0	26	1.6	50	.....	.....	.....	.....	
	4.00..	1.0	30	1.6	54	.....	.....	.....	.....	
"	11..10.00..	.9	48	1.6	72	3.4	0	.....	.....	
	12.00..	.9	50	1.6	74	3.4	2	2.0	0	
	4.00..	.9	54	1.6	78	3.3	6	2.5	4	
"	12..10.00..	.9	72	1.7	96	3.0	24	2.2	22	
	12.00..	.9	74	1.7	98	3.0	26	2.1	24	
"	14..10.00..	.9	120	2.1	144	2.5	72	1.7	70	
	12.00..	.9	122	2.2	146	2.6	74	1.7	72	
	4.00..	.9	126	2.2	150	2.7	78	1.7	76	
"	15..10.00..	1.0	144	2.4	168	2.9	96	1.8	94	
	12.00..	.9	146	2.6	170	2.9	98	1.9	96	
	4.00..	.9	150	2.5	174	3.0	102	1.9	100	
"	16..10.00..	1.0	168	2.7	192	.....	.....	.....	.....	
	12.00..	1.0	170	2.7	194	.....	.....	.....	.....	
	4.00..	1.0	174	2.7	198	.....	.....	.....	.....	
"	17..10.00..	1.0	192	2.8	216	2.3	0	2.0	0	
	12.00..	1.1	194	2.9	218	2.3	2	2.0	2	
	4.00..	1.1	198	3.0	222	2.3	6	1.9	6	
"	18..10.00..	1.2	216	3.3	240	2.0	24	1.6	24	
	12.00..	1.2	218	.....	.....	2.0	26	1.6	26	
	4.00..	1.2	222	.....	.....	1.9	30	1.5	30	
"	19..10.00..	1.3	240	1.7	40	2.0	48	1.6	48	
"	21..10.00..	1.5	288	1.8	48	3.2	96	2.1	96	
	12.00..	1.5	290	1.8	50	3.2	98	2.1	98	
	4.00..	1.7	294	1.9	54	.....	.....	2.5	102	
"	22..10.00..	1.8	312	1.9	72	.....	.....	2.9	120	
	12.00..	1.9	314	1.9	74	.....	.....	2.9	122	
	4.00..	2.0	318	2.0	78	.....	.....	2.9	126	
"	23..10.00..	2.3	336	2.3	96	.....	.....	3.4	144	
	12.00..	2.2	338	2.3	98	.....	.....	.....	.....	
	4.00..	2.2	342	2.3	102	2.5	.....	.....	.....	
April	4..12.00..	1.2	0	2.5	0	3.5	.....	2.4	0	
	4.00..	1.2	4	2.5	4	3.6	.....	2.4	4	
	5.00..	1.4	22	2.7	22	.....	.....	3.1	22	
	12.00..	1.4	24	2.7	24	.....	.....	3.1	24	
	4.00..	1.4	28	2.7	28	.....	.....	3.1	28	
"	6..10.00..	1.6	46	3.0	46	.....	.....	.....	.....	
	12.00..	1.6	48	3.1	48	3.3	0	.....	.....	
	4.00..	1.6	52	3.2	52	3.3	4	.....	.....	
"	7..10.00..	1.8	70	.....	.....	3.3	22	.....	.....	
	12.00..	1.8	72	.....	.....	3.5	24	.....	.....	
	4.00..	1.8	76	.....	.....	3.5	28	.....	.....	
"	8..10.00..	2.0	94	.....	.....	3.5	46	.....	.....	
	12.00..	2.0	96	.....	.....	3.4	48	2.1	10	
	4.00..	2.0	106	.....	.....	3.5	52	2.0	204	
"	9..10.00..	2.0	118	.....	.....	3.7	70	1.9	122	
	12.00..	2.2	120	.....	.....	.....	.....	2.0	224	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910									
April 28..10.30..	1.3	0	2.9	0	5.0	.....	3.0	.....	
12.00..	1.3	2	2.9	2	.....	.....	2.9	.....	
4.00..	1.4	6	3.0	6	.....	.....	3.3	.....	
" 29..10.00..	1.6	24	.....	.....	.....	.....	.....	.....	
12.00..	1.8	26	.....	.....	3.1	0	.....	.....	
4.00..	2.0	30	2.5	0	3.2	2	.....	.....	
	.....	.....	.....	.....	3.1	6	2.3	.....	
" 30..10.00..	2.7	48	2.3	18	3.5	24	2.4	18	
May 2..10.00..	2.2	96	2.2	66	3.1	72	2.2	66	
12.00..	2.5	98	2.3	68	.....	.....	2.4	68	[May 2nd.
4.00..	3.0	102	2.5	72	.....	.....	2.4	72	C start at 4.30 p.m.]
" 3..10.00..	3.7	120	2.8	90	3.1	18	3.05	90	A stops at 10.00 a.m.
12.00..	.....	.....	2.9	92	3.1	20	3.25	92	
4.00..	.....	.....	3.0	96	3.1	24	3.6	96	
" 4..10.00..	.....	.....	3.5	114	3.5	42	5.3	114	
1.00..	.95	.....	3.9	117	3.75	45	.....	.....	
4.00..	1.00	3	4.05	120	3.95	48	.....	.....	
" 5..9.00..	.95	20	4.7	137	5.8	65	.....	.....	
12.00..	.90	23	.....	.....	.....	.....	.....	.....	
3.00..	.90	26	.....	.....	.....	.....	2.83	.....	
5.00..	.90	28	.....	.....	.....	.....	2.15	2	
" 6.. 9.30..	.91	44.5	.....	.....	.....	.....	2.62	18.5	
11.00..	.93	46	.....	.....	.....	.....	2.57	20	
3.15..	.93	50.25	2.28	.25	3.02	.5	2.55	34.25	C starts at 2.45 May 6.
4.15..	.96	51.25	2.26	1.25	3.00	1.5	2.56	25.25	
" 7..10.00..	.96	69	2.25	19	3.03	19.75	2.77	43	
11.30..	1.04	70.5	2.25	20.5	3.02	20.75	2.81	44.5	
" 9.. 9.30..	1.04	116.5	2.23	66.5	3.18	66.75	4.82	66.5	
1.30..	.99	120.5	2.32	70.5	3.38	70.75	.....	.....	D stopped at 9.30 a.m.
4.00..	1.00	123	2.33	73	3.49	73.25	.....	.....	C stopped at 4.30 p.m.
" 10..10.00..	1.1	141	2.33	91	.....	.....	.....	.....	
12.00..	1.12	143	2.34	93	.....	.....	.....	.....	C and D start at 3.45
4.00..	1.20	147	2.41	97	.....	.25	.....	.25	p.m. C—5 mill.
" 11..10.30..	1.42	165.5	2.95	115	1.25	18.75	2.66	18.75	
12.00..	1.44	117	2.75	117	1.26	20.75	2.66	20.75	
4.00..	1.48	171	2.80	121	1.23	24.75	2.66	24.75	
" 12.. 9.30..	1.75	188.5	3.15	138	1.20	42.25	2.68	42.25	
12.00..	1.77	191.	3.21	140.5	1.21	44.75	2.67	44.75	
4.30..	1.83	195.5	3.51	145	1.23	49.25	2.68	49.25	B stopped at 4.30 p.m.
" 13..10.30..	1.95	213.5	.....	.....	1.28	67.25	2.71	67.25	
12.15..	1.95	215.25	.....	.....	1.26	69	2.79	69	
3.45..	.....	.....	2.42	.75	1.26	.....	2.78	.....	B started at 3.00 p.m.,
" 14.. 9.30..	2.20	236	2.27	18.5	1.25	90.25	3.24	90.25	May 13.
12.00..	2.21	238.5	2.27	21	1.31	92.75	3.29	92.75	
" 16..10.30..	2.26	285	1.96	67.5	1.31	139.25	.....	.....	
2.00..	2.37	288.5	1.97	71	1.33	142.75	.....	.....	D started at 2.45 p.m.
4.30..	2.33	291.5	1.89	73.5	1.42	145.25	2.66	0	
" 17..10.00..	3.07	308.5	2.22	91	1.95	162.75	2.59	17.5	
11.30..	3.22	310.5	2.34	92.5	2.05	164.25	2.61	19	
4.30..	3.48	315.5	2.85	97.5	2.38	169.25	2.78	24	
" 18.. 9.30..	.....	.....	4.37	114.5	3.42	186.25	4.50	41	
	.....	.....	.....	.....	.....	.....	.....	.....	A, B, C and D started
" 21.. 1.00..	1.17	2	2.90	2	3.03	2	2.97	2	at 11.00 a.m. May 21
" 23.. 9.30..	1.36	44.5	2.98	44.5	5.07	44.5	5.67	44.5	
12.00..	1.45	47	3.27	47	2.21	47	2.32	47	D and C at 5 million
4.00..	1.75	51	3.45	51	.....	.....	.....	.....	gal. rate.
" 25..10.00..	2.97	93	5.27	93	.....	.....	.....	.....	
2.00..	3.12	97	.....	.....	.....	.....	.....	.....	
4.00..	4.30	99	.....	.....	.....	.....	.....	.....	

EXPERIMENTAL STATION.

Sand Filters.—Appendix E.

Loss of Head and Hours Run.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910.									
May 26..10.00..	4.10	117	.....	.....	2.94	0	1.41	0	
12.00..	.....	.....	.....	.....	2.77	2	1.41	2	
5.00..	.....	.....	.....	.....	2.75	7	1.43	7	
" 27.. 9.30..	.....	.....	.....	.....	3.00	23.5	1.48	23.5	
2.00..	.....	.....	.....	.....	3.21	28	1.61	28	
5.00..	.....	.....	2.21	0	3.47	31	1.69	31	D at 7 million rate.
" 28..10.30..	.....	.....	2.09	17.5	4.47	48.5	2.07	48.5	
12.00..	.....	.....	2.11	19	.....	.....	2.15	50	C resting to see if head can be recovered.
2.00..	1.43	0	.....	21	.....	.....	.....	.....	
" 30.. 9.30..	.....	19.5	2.01	64.5	.....	.....	3.45	.....	
11.30..	1.15	21.5	.....	66.5	.....	.....	.....	.....	
4.30..	1.25	26.5	2.13	71.5	2.12	.....	.....	.....	
" 31..11.00..	1.46	45	2.61	90	2.65	.....	.....	.....	
12.00..	1.55	46	2.70	91	2.76	.....	.....	.....	
" 4.30..	1.60	50.5	2.87	95.5	2.87	.....	.....	.....	
June 1..10.30..	1.97	68.5	3.18	113.5	2.95	.....	.....	.....	
11.30..	.....	.....	.....	.....	.....	.....	2.52	.....	
1.30..	1.99	71.5	3.22	116.5	3.17	.....	2.65	.....	
4.30..	2.08	74.5	3.23	119.5	3.14	.....	2.85	.....	
" 2..11.00..	2.85	93	4.35	138	3.90	.....	5.87	.....	
4.30..	2.84	98.5	.....	.....	.....	.....	.....	.....	
" 3..10.00..	2.90	116	.....	.....	.....	.....	.....	.....	
12.00..	2.93	118	.....	.....	.....	.....	2.34	.....	
2.00..	3.01	120	2.17	0	.....	.....	2.39	.....	
5.00..	3.03	123	2.11	3	.....	.....	2.47	.....	
" 4.. 9.30..	3.11	139.5	2.01	19.5	.....	.....	2.63	.....	
11.00..	3.18	141.	2.01	21	2.85	.....	2.70	.....	
" 6.. 9.30..	5.80	187.5	2.70	67.5	4.88	.....	.....	.....	D pugged up tight.
1.30..	.70	0	3.05	71.5	.....	.....	2.57	0	
7.. 9.30..	.81	21	3.22	91.5	.....	.....	2.55	21	
12.00..	.77	23.5	3.33	94	.....	.....	2.54	23.5	
4.30..	.82	28	3.51	98.5	2.90	0	2.67	28	
" 8..10.30..	.82	46	4.57	116.5	2.75	18	3.47	46	
2.00..	.88	49.5	.....	.....	2.86	21.5	4.87	49.5	
4.00..	.92	51.5	.....	.....	2.97	23.5	4.38	51.5	
" 9..12.00..	1.37	71.5	.....	.....	2.43	43.5	.....	.....	
2.00..	1.46	73.5	.....	.....	3.45	45.5	.....	.....	
5.30..	1.49	77	.....	.....	3.56	49	.....	.....	
" 10,.10.00..	1.65	93.5	2.10	0	3.71	65.5	.....	.....	
11.30..	1.73	95	2.09	1.5	4.06	67	.....	.....	
" 11.. 9.30..	2.15	117	1.95	23.5	4.90	89	.....	.....	
12.00..	2.35	119.5	1.95	26	.....	.....	.....	.....	
" 13..10.00..	3.09	164.5	2.00	72	.....	.....	2.04	0	
12.00..	3.31	166.5	2.10	74	.....	.....	2.25	2	
4.30..	3.87	171	2.27	78.5	3.07	0	2.47	6.5	
" 14..10.00..	3.90	188.5	2.52	96	3.27	17.5	3.27	24	
12.00..	3.98	190.5	2.59	98	3.34	19.5	3.35	26	
4.00..	.64	0	2.92	102	3.46	23.5	3.73	30	
" 15..10.00..	1.01	18	3.31	120	3.87	41.5	4.57	48	
2.00..	1.18	22	3.39	124	3.85	45.5	.....	.....	
5.00..	1.29	25	3.42	127	4.00	48.5	2.03	0	
" 16..10.00..	1.70	42	4.27	144	4.67	65.5	2.59	17	
12.00..	1.77	44	4.35	146	4.77	67.5	2.70	19	
4.00..	1.99	48	4.85	150	4.97	71.5	2.85	23	
" 17..10.00..	2.67	66	6.25	168	.....	.....	.....	.....	a.m., June 17. B, C and D off at 11
4.00..	3.21	72	1.09	1	2.80	1	1.66	1	B, C and D start at 3 p.m.
" 18.. 9.30..	5.17	89.5	1.27	18.5	3.37	18.5	1.70	18.5	
12.30..	.....	.....	1.31	21.5	3.48	21.5	1.83	21.5	A stopped at 12 a.m.

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910.									
June 20..10.00..	.....	.....	2.73	67	5.97	67	5.17	67	
12.00..	.....	.....	3.11	69	.....	.....	.....	.....	
5.30..	.....	.....	4.10	74.5	.....	.....	.....	.....	[adding strip 5.00.
" 21.. 5.00..	.95	0	5.90	98	.....	.....	1.58	0	A and D start after
" 22..10.00..	.85	17	.....	.....	2.47	.....	1.81	17	C starts after strip
12.00..	.86	19	.....	.....	2.58	2	1.96	19	9.30.
4.00..	.95	23	1.73	0	2.71	6	2.20	23	B starts after adding
" 23..10.00..	.81	41	1.75	18	2.78	24	2.33	41	strip.
12.00..	.81	43	1.77	20	2.81	26	2.31	43	
4.30..	.69	47.5	1.77	24.5	2.86	30.5	2.32	47.5	
" 24..10.00..	.70	65	1.63	42	2.75	48	2.27	65	
11.30..	.65	66.5	1.52	43.5	2.73	49.5	2.28	66.5	
" 25.. 4.00..	.67	71	1.56	49	2.70	54	2.38	71	
10.00..	.59	89	1.73	66	3.27	72	3.20	89	
12.00..	.67	91	1.65	68	3.33	74	3.39	91	
" 27..10.00..	.55	137	2.85	114	5.1	120	5.8	137	
12.00..	.65	139	2.76	116	.....	.....	.....	.....	[p.m., June 27.
5.00..	.61	144	1.17	121	1.98	.....	1.43	3	D and C start at 2
" 28..10.00..	.74	161	1.40	138	2.50	20	2.00	20	
12.00..	.75	163	1.39	140	2.52	22	2.11	22	
4.00..	.82	167	1.60	144	2.82	26	2.40	26	
" 29..12.00..	.82	187	1.77	164	4.27	46	3.93	46	
4.00..	.97	191	1.87	168	4.72	50	4.23	50	
" 30..10.00..	1.03	209	2.25	186	6.27	68	5.55	68	
4.00..	1.05	213	2.47	192	.....	.....	.....	.....	
July 2..10.00..	1.05	257	3.80	234	.....	.....	.....	.....	
12.00..	1.04	259	3.82	236	.....	.....	.....	.....	
" 3..10.00..	1.19	281	5.00	258	2.05	0	1.46	0	
" 4..12.00..	1.30	307	5.37	284	2.11	26	1.63	26	
5.00..	.91	312	2.79	0	2.50	31	2.19	31	
" 5..12.00..	1.23	331	4.70	19	4.55	50	3.04	50	
4.30..	1.27	335.5	5.11	23.5	5.21	54.5	3.78	54.5	
" 6.. 9.30..	1.32	352.5	5.48	40.5	5.9	71.5	4.90	71.5	
12.00..	1.31	355	.....	43	.....	.....	.....	.....	
4.00..	1.35	359	2.43	47	2.65	0	2.10	0	
" 7..10.00..	1.20	377	2.30	65	2.71	18	2.18	18	
12.00..	1.41	379	2.29	67	2.80	20	2.27	20	
4.00..	1.49	283	2.48	71	3.07	24	2.58	24	
" 8..10.00..	1.46	401	2.65	89	3.13	42	2.25	42	
12.00..	1.44	403	2.69	91	3.70	44	3.57	44	
4.00..	1.48	407	2.61	95	4.00	48	4.00	48	
" 9..10.00..	1.61	425	4.20	113	5.17	66	4.9	66	
12.00..	1.56	427	.....	.....	.....	.....	.....	.....	
" 11..12.00..	1.60	475	1.97	0	.....	.....	.....	.....	Cleaned B at 9.30
4.00..	1.59	479	1.97	4	.....	.....	.....	.....	July 11th.
" 12..10.00..	1.52	497	2.19	22	.....	.....	.....	.....	
12.00..	1.44	499	2.30	24	2.88	0	2.82	0	
4.00..	1.23	503	2.30	28	3.10	4	3.04	4	
" 13..10.00..	1.07	521	2.04	46	4.18	22	3.85	22	
12.00..	1.09	523	2.21	48	4.23	24	4.07	24	[4 p.m., July 13th.
4.00..	1.14	527	2.38	52	4.88	28	4.58	28	C and D shut off at
" 14..10.00..	1.26	545	2.61	70	3.22	0	2.90	0	C & D started 10 a.m.
12.00..	1.29	547	2.64	73	3.78	2.30	3.68	2.30	Not cl'n'd, stood only
4.00..	1.25	551	3.11	76	4.11	6.34	4.8	6.34	C and D stopped at
" 15..10.00..	1.21	569	3.50	94	.....	.....	.....	.....	4 p.m., July 14th.
12.00..	1.50	571	3.69	96	2.92	0	2.61	0	
4.00..	1.52	575	3.75	100	3.03	4	2.68	4	
" 16..10.00..	1.36	593	4.00	118	3.41	22	3.32	22	
12.00..	1.65	595	4.16	120	3.42	24	3.29	24	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910									
July 18.. 9.30..	1.88	640.5	.....	.....	.....	.....	.....	.....	B C and D cut out.
12.00..	1.83	643	.....	.....	.....	.....	.....	.....	A, 10 to 11.30, stopped to sterilize box,
5.00..	2.00	648	2.03	1	3.55	1	2.87	1	
" 19..10.00..	2.03	665	2.04	18	3.61	18	2.80	18	
12.00..	2.06	667	2.03	20	3.59	20	2.80	20	
4.00..	2.07	671	2.07	24	3.58	24	2.80	24	
" 20..10.00..	2.18	689	2.21	42	3.81	42	3.11	42	
12.00..	2.21	691	2.18	44	3.88	44	.....	.....	
5.00..	2.21	696	2.23	49	3.87	49	2.86	1	
" 21..10.00..	2.14	713	2.50	66	4.27	66	3.36	18	
12.00..	2.32	715	2.58	68	4.35	68	3.51	20	
4.00..	2.39	719	2.73	72	4.58	72	3.70	24	
" 22..10.00..	2.77	737	3.48	90	5.46	90	4.64	42	C and D cut out
12.00..	2.91	739	3.64	92	.....	.....	.....	.....	10 a.m., July 22nd.
4.30..	3.08	743.5	3.95	96.5	3.74	.5	2.82	.5	
" 23..10.00..	3.53	761	4.67	114	4.08	18	2.99	18	
12.00..	3.62	763	4.75	116	4.17	20	3.04	20	[B C and D stopped.
" 25..10.00..	4.62	809	.....	.....	5.35	66	4.65	66	B lost all head. A
" 26..12.00..	.....	.....	.....	.....	3.50	2	2.92	2	D and C started 10
4.00..	1.36	0	2.22	0	3.72	6	3.13	6	p.m.
" 27..10.00..	1.32	18	2.28	18	4.32	24	3.28	24	
12.00..	1.33	20	2.32	20	4.48	26	3.27	26	
4.00..	1.33	24	2.34	24	4.91	30	3.32	30	
" 28..10.00..	1.29	42	2.34	42	5.38	48	3.37	48	
1.00..	1.26	45	2.34	45	.....	.....	3.34	59	
5.00..	1.24	49	2.30	49	.....	.....	3.31	55	
" 29..10.00..	1.20	66	2.35	66	.....	.....	3.24	72	
12.00..	1.20	68	2.38	68	.....	.....	3.25	74	
4.00..	1.20	72	2.44	72	4.27	0	3.27	78	
" 30..10.00..	1.20	90	2.66	90	4.43	18	3.16	96	
12.00..	1.17	92	2.81	92	4.50	20	3.23	98	
Aug. 2..10.00..	1.05	162	3.81	162	5.40	90	3.18	168	
12.00..	1.04	164	4.05	164	.....	.....	3.22	170	
4.30..	1.06	168.5	.....	.....	.....	.....	3.25	174.5	
" 3..10.00..	1.00	186	.....	.....	.....	.....	3.28	192	
12.00..	1.00	188	.....	.....	.....	.....	3.31	194	C and B start at 2 p.m
4.00..	.96	192	2.01	2	3.29	2	3.25	198	
" 4..10.00..	.86	210	1.85	20	3.12	20	3.04	216	
12.30..	.78	212.5	1.76	22.5	3.10	22.5	2.99	218.5	
4.00..	.72	216	1.79	26.5	3.02	26.5	2.93	222	
" 5..10.00..	91	234	1.98	44	3.54	44	2.36	240	
12.00..	.91	236	2.02	46	3.58	46	3.38	242	
4.00..	.94	240	2.03	50	3.69	50	3.44	246	
" 6..10.00..	1.05	258	2.17	68	4.01	68	3.79	264	
12.00..	1.00	260	2.15	70	4.00	70	3.82	266	
" 8..10.00..	1.05	306	2.36	92	4.78	.....	4.62	.....	
12.00..	1.04	308	2.35	94	.....	.....	.....	.....	
" 9..10.00..	1.06	330	2.52	116	.....	.....	.....	.....	
12.00..	1.10	332	2.58	118	.....	.....	.....	.....	
3.30..	1.16	335.5	2.77	121.5	4.10	3.5	3.13	3.5	
" 10..10.00..	1.04	354	2.67	140	3.77	22	3.07	22	
12.00..	1.03	356	2.67	142	3.81	24	3.00	24	
" 11..10.00..	1.15	378	3.20	164	3.99	46	3.15	46	
12.00..	1.15	380	3.36	166	4.04	48	3.24	48	
4.00..	1.17	384	3.41	170	4.10	52	3.33	52	
" 12..10.00..	1.12	402	3.54	188	4.10	70	3.54	70	
12.00..	1.23	404	4.08	190	4.32	72	3.90	72	
4.00..	.....	408	4.23	194	4.46	76	3.94	76	A fixing the overflow.
" 13..10.00..	.....	426	4.43	212	4.34	94	4.28	94	do do

EXPERIMENTAL STATION.

Sand Filters.—Appendix E.

Loss of Head and Hours Run.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks.
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910	Filters refilled and all run together at same rate.								A, B, C & D at 5M.. Gal. per acre per day.
Aug.....12.00..	1.36	428	4.71	214	4.88	96	4.43	96	
" 15.. 9.30..	1.09	473.5	5.	259.5	6.	141.5	.....	141.5	
12.00..	1.02	476	.....	.....	.....	.....	.....	.....	
4.00..	.94	480	.....	.....	.....	.....	.....	.....	
" 16..10.00..	.95	498	1.17	0	2.73	0	2.47	0	B, C and D being cleaned.
4.00..	.92	504	1.16	6	2.71	6	2.42	6	
" 17..10.00..	.81	522	1.64	24	3.98	24	2.52	24	
12.00..	.88	524	1.75	26	4.33	26	2.63	26	
4.00..	.91	528	2.14	30	5.	30	3.07	30	
" 18..10.00..	1.11	546	4.	48	.....	.....	6.	48	
12.00..	1.25	548	.....	.....	.....	.....	.....	.....	
4.00..	1.21	552	.....	.....	.....	.....	.....	.....	
" 19..10.00..	1.40	570	.....	.....	.....	.....	.....	.....	
12.00..	1.45	572	.....	.....	.....	.....	.....	.....	
5.00..	1.59	577	.....	.....	.....	.....	.....	.....	
" 20..10.00..	1.88	594	.....	.....	.....	.....	.....	.....	
" 22..10.00..	2.08	642	.....	.....	.....	.....	.....	.....	
4.00..	2.37	648	.....	.....	.....	.....	.....	.....	
" 23.. 4.00..	2.58	672	.....	.....	.....	.....	.....	.....	
" 30..12.00..	.72	0	1.04	0	.86	0	1.05	0	T=17°C.
5.00..	.81	5	1.26	5	.96	5	1.20	5	
" 31..12.00..	.95	24	1.36	24	1.07	24	1.38	24	T=18°C.
4.00..	.97	28	1.37	28	1.06	28	1.52	28	
Sep. 1..10.00..	1.05	46	1.50	46	1.19	46	1.69	46	T=16°.5C.
2.00..	1.16	50	1.55	50	1.24	50	1.75	50	
4.00..	1.23	52	2.10	52	1.33	52	1.95	52	T=16°C.
" 2..10.00..	1.30	70	2.16	70	1.98	70	2.10	70	T=16°.5C.
4.00..	1.40	76	2.30	76	2.11	71	2.34	76	
" 3..10.00..	1.27	94	2.30	94	1.86	94	2.23	94	T=17°.0C.
4.00..	1.35	100	2.37	100	1.91	100	2.34	100	
" 6.. 9.30..	2.21	165.5	3.99	165.5	2.99	165.5	3.01	165.5	T=17°.0C
12.00..	2.48	168	4.66	168	3.48	168	3.44	168	
4.00..	2.66	172	5.05	172	3.82	172	3.74	172	
" 7..10.00..	2.04	190	.....	.....	4.57	190	4.06	190	
12.00..	2.36	192	.....	.....	4.50	192	4.07	192	
4.00..	2.46	196	.....	.....	4.61	196	4.15	196	
" 8..10.00..	2.95	214	.95	.25	5.24	214	4.55	214	B started at 9.45 a.m.
12.00..	3.02	216	.96	2	.....	.....	4.52	216	
4.00..	3.10	220	.92	6	.50	0	4.53	220	17°.5C.
" 9..10.00..	3.45	238	.92	24	.50	18	4.37	238	
12.30..	3.50	240.5	.88	26.5	.50	20.5	4.41	240.5	17°.2C.
4.00..	3.64	244	.92	30.5	.50	24.5	4.50	244	
" 10.. 9.30..	4.03	261.5	.87	47.5	.54	41.5	4.86	261.5	
12.00..	4.22	264	.90	50	.55	44	.....	.....	16°.0C.
" 12..10.00..	4.73	310	.96	96	.56	90	.....	.....	17°.0C.
12.00..	.....	.....	1.01	98	.50	92	.....	.....	A started at 2.45 p.m.
4.00..	.62	1	1.02	102	.65	96	.85	1	
" 13..11.00..	.58	22	1.04	121	.70	115	.90	22	
4.30..	.59	27.5	1.09	126.5	.71	120.5	.87	27.5	
" 14..10.30..	.58	45.5	.84	144.5	.56	138.5	.89	45.5	
12.00..	.55	47	.98	146	.63	140	.89	47	
4.00..	.50	51	1.07	150	.71	144	.92	51	17°.C.
" 15..10.00..	.26	69	1.49	168	.99	162	1.00	69	
12.00..	.68	71	1.48	170	1.02	164	1.01	71	
4.00..	.70	75	1.50	174	1.00	168	1.02	75	
" 16..10.00..	.69	93	1.62	192	.91	186	.97	93	
12.00..	.70	95	1.71	194	.93	188	.99	95	

EXPERIMENTAL STATION.

Sand Filters.—Appendix E.

Loss of Head and Hours Run.

Date and hour	Tank A		Tank B		Tank C		Tank D		Remarks.
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910									
4.30..	.71	99.5	1.76	198.5	.93	192.5	.99	99.5	
Sep. 17..10.00..	.67	117	1.97	216	.90	210	.93	117	
12.00..	.76	119	2.05	218	1.01	212	.94	119	
" 19..10.00..	.92	165	2.81	264	1.51	258	.91	165	
12.00..	1.02	167	3.01	266	1.65	260	1.01	167	
" 20..12.00..	1.40	191	4.02	290	2.42	284	1.54	191	
5.00..	1.48	196	4.01	295	2.65	289	1.70	196	
" 21..12.00..	1.54	215	4.42	314	2.91	308	1.78	215	
5.00..	1.61	220	4.27	319	2.80	313	1.83	220	
" 22.. 5.10..	2.02	244	.....	.....	3.56	337	2.68	244	B stopped Sep. 21, 5 p.m.
" 23..10.00..	2.18	261	.....	.....	3.79	354	2.73	261	
12.00..	2.29	263	.60	0	4.03	356	3.18	263	
" 24..10.00..	2.27	285	.66	22	3.97	378	3.32	285	
12.00..	2.51	287	.69	24	4.35	380	3.65	287	
" 26..12.00..	4.22	335	1.86	72	.....	.....	.....	.....	
5.00..	4.37	340	1.84	77	.99	1	.....	.....	C started at 4 p.m.
" 27..12.00..	4.47	359	1.91	96	1.06	20	.....	.....	Started at 2 p.m. D Sep. 27.
4.00..	4.53	363	1.92	100	1.05	24	.98	2	
" 28..12.00..	4.49	383	1.80	120	1.04	44	1.16	22	
" 29..12.00..	4.71	407	1.90	144	1.05	68	1.12	46	
5.00..	4.75	412	1.94	149	.92	73	1.12	51	
" 30..12.00..	.....	.....	2.11	168	1.16	92	1.15	70	A stopped at 9.30 a.m.
5.00..	.99	0	2.19	173	1.15	97	1.20	75	A started at 5 p.m.
Oct. 1..12.00..	.86	19	2.30	192	1.13	116	1.25	94	
" 3..12.00..	1.16	65	.....	.....	1.94	164	1.40	142	
.00..	1.15	72	1.11	0	1.84	169	1.30	147	
" 4..12.00..	1.04	91	1.08	19	1.67	188	1.20	166	
4.00..	1.09	95	.99	23	1.65	192	1.25	170	
" 5..12.00..	1.20	115	1.03	43	3.00	212	1.49	190	
" 6..12.00..	1.10	139	1.01	67	2.77	236	1.45	214	
" 7..12.00..	1.18	163	1.08	91	3.22	260	1.66	238	
4.00..	1.33	167	1.05	95	3.41	264	1.82	242	
" 8..12.00..	1.44	187	1.11	115	3.86	284	2.20	262	
" 10..12.00..	1.50	235	1.07	163	4.25	332	2.65	310	
" 11..12.00..	1.52	259	1.16	187	4.42	356	2.88	334	
3.30..	1.60	262.5	1.26	190.5	4.62	359.5	3.12	337.5	
" 12..12.00..	1.69	283	1.35	211	5.07	380	3.30	358	
5.00..	1.82	288	1.41	216	2.05	0	3.57	363	C rate changed to 10 million gals.
" 13..15.00..	1.93	307	1.48	235	1.90	19	3.82	382	
5.00..	2.09	312	1.55	240	1.87	24	4.21	387	
" 14..12.00..	2.15	331	1.52	259	1.70	43	.....	.....	D stopped.
" 15..12.00..	2.34	355	1.56	283	1.66	67	2.65	0	
" 17..12.00..	2.98	403	1.96	331	1.78	115	2.56	48	
5.30..	3.13	408.5	2.04	336.5	1.89	120.5	2.55	53.5	
" 18..12.00..	3.36	427	2.25	355	2.17	139	2.72	72	
5.00..	3.36	432	2.26	360	2.16	144	2.55	77	
" 19.. 5.00..	3.32	456	2.28	384	2.32	168	2.83	101	
" 20..10.00..	3.41	473	2.33	401	2.60	185	2.89	118	
" 21..10.00..	4.40	497	2.83	425	3.18	209	.....	.....	D stopped entirely by surface clogging, all plugged tight.
" 22	.....	.....	.....	.....	.....	.....	.....	.....	
" 24..10.00..	1.82	0	.....	.....	.....	.....	.....	.....	
4.00..	1.78	6	2.31	0	2.35	0	2.92	0	
" 25.. 5.00..	1.73	31	2.17	26	2.36	26	3.18	26	
" 26..10.00..	1.76	48	2.23	43	2.48	43	3.88	43	
5.00..	1.82	52	2.23	50	2.68	50	3.47	50	
" 27..12.00..	2.35	71	2.25	69	3.14	69	5.52	69	
5.30..	2.72	76.5	2.47	74.5	3.59	74.5	.....	.....	
" 28.. 5.00..	3.81	95	3.27	98	5.24	98	2.78	1	D started at 4.15 p.m.
" 29..12.00..	5.14	114	4.36	117	.....	.....	2.67	20	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX E.

LOSS OF HEAD AND HOURS RUN.

Date and hour	Tank A		Tank B		Tank C		Dank D		Remarks.
	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	Total loss of head	Hours run	
1910.									
Nov. 1..10.00..	2.45	0	2.81	0	2.18	0	2.66	90	
5.00..	4.10	7	4.81	7	3.55	7	2.83	97	
" 2..12.00..	low	26	stop'd	26	4.98	26	3.30	116	
3.30..	.....	.....	.....	.....	4.37	29.5	3.05	119.5	
" 4..12.00..	2.27	0	1.79	0	2.82	74	plug'd	.....	
3.00..	2.26	3	1.82	3	2.88	77	3.51	0	D started at 3 p.m.,
" 5..10.30..	3.38	22.5	.23	22.5	4.32	96.5	4.18	19	Nov. 4th. T=7°.2c.
" 7..	.....	.....	.....	.....	.....	.....	.....	.....	All filters plugged
" 8..11.30..	.....	.....	2.46	1.5	3.01	1.5	3.30	1.5	tightly.
4.30..	2.34	.5	2.30	6.5	2.90	6.5	3.13	6.5	
" 9..10.00..	2.38	18	2.78	24	2.90	24	3.57	24	
5.00..	2.71	25.0	3.05	31	3.28	31	3.95	31	
" 10..10.00..	3.37	42	4.35	48	4.31	48	5.20	48	
4.00..	3.93	48	4.80	54	4.85	54	5.63	54	
" 11..12.00	5.63	68	.....	.....	.....	.....	.....	.....	
5.00..	.....	.....	.....	.....	4.10	0	1.28	0	3 mill. rate D, 5 p.m.
" 12..12.00..	.77	0	.97	0	4.96	19	1.13	19	
" 14..10.00..	.66	46	.80	46	1.90	65	.83	65	C rate changed to 3
5.00..	.66	53	.79	53	3.52	72	.95	72	million gals.
" 15..11.00..	.65	71	.75	71	4.62	90	1.05	90	
" 16..12.00..	.65	97	.71	97	.....	.....	.93	116	
" 17..12.00..	.55	121	.67	121	1.20	0	.93	140	
4.30..	.62	125.5	.61	125.5	1.04	.....	.91	144.5	
" 18..11.30..	.56	144.5	.59	144.5	.98	23.5	.94	163.5	
" 19..11.00..	.61	168	.64	168	.72	47	.98	187	6°. C.
" 21..12.00..	.73	217	.80	217	.71	96	1.23	236	
4.30..	.76	221.5	.74	221.5	.82	100.5	1.29	240.5	
" 22..12.00..	.86	241	.92	241	.71	120	1.60	260	
" 23.. 4.00..	1.01	269	.97	269	.70	148	1.69	288	
" 24.. 2.00..	1.13	291	1.07	291	.73	170	1.92	310	
4.30..	1.15	293.5	1.06	293.5	.73	172.5	1.98	312.5	
" 25..10.30..	1.25	311.5	1.16	311.5	.79	190.5	2.16	330.5	
4.00..	1.27	317	1.17	317	.75	196	2.19	336	
" 26.. 1.00..	1.44	338	1.28	338	.88	217	2.60	357	
" 28..10.00..	1.62	383	1.41	383	1.00	2.62	3.07	402	
" 29..10.00..	2.94	407	2.17	407	.74	286	7.21	426	
Filters all shut off during repairs to water main outside 4 hours.									
Dec. 1.. 5.00..	4.99	432	4.34	432	2.90	311	.....	451	T=5°. 5C.
" 2..	.....	.....	.....	.....	3.66	335	.....	.....	A started at 4 p.m. D
" 3..12.30..	.73	.....	.....	.....	3.92	354.5	.....	.....	at 2.30 p.m. B start-
" 5..10.00..	.61	.....	.87	.....	4.41	400.5	.97	.....	ed at 12.30 a.m.
4.00..	.67	.....	.88	.....	.....	.....	.92	.....	
" 6.. 9.45..	.70	.....	.80	.....	.98	.....	.99	.....	T=3°. C.
" 7.. 4.00..	.88	.....	.87	.....	1.38	.....	.87	.....	
" 8.. 3.30..	1.25	.....	1.01	.....	1.46	.....	1.26	.....	T=3°. 3C..
" 9.. 4.30..	1.28	.....	1.09	.....	1.51	.....	1.49	.....	3°. 5C.
" 10..11.30..	1.46	.....	1.19	.....	1.54	.....	1.66	.....	
Filters all shut down 3 p.m. till 9.30 a.m. Dec. 14th. (Intake raised, sand at mouth.)									
" 14.. 3.00..	3.38	.....	4.05	.....	1.12	.....	2.90	.....	T=2°.5C.
" 15..	.....	.....	.....	.....	.....	.....	.....	.....	A & B start at 3 p.m.
" 16.. 5.00..	.88	.....	1.08	.....	1.02	.....	4.63	.....	T=3°. 0C.
" 19.. 3.00..	.84	.....	.87	.....	.83	.....	1.12	.....	T=3°.2C. D cleaned Dec. 17, a.m.
" 22.. 3.45..	.79	.....	.79	.....	.73	.....	.95	.....	T=3°.5C.
" 27.. 3.45..	1.23	.....	1.10	.....	.87	.....	1.05	.....	T=3°.0C.
" 30.. 4.30..	1.34	.....	1.29	.....	1.02	.....	1.27	.....	T=3°.0C.
1911.									
Jan. 3.. 5.00..	1.55	.....	1.36	.....	1.10	.....	1.64	.....	

APPENDIX F.

EXPERIMENTAL STATION.

Sand Filters.—Appendix F.

Resistance Loss of Head (in feet) for 1 Foot of Sand.

Date.	Tank A		Tank B		Length of run in hours	Tank C		Tank D		Turbidity.
	1st foot x.	2nd foot y.	1st foot x.	2nd foot y		x	y	x	y	
1910	rate 5 million									
May 4 1 p.m.	.3	.4	.....	.....	½	.....	.....	.....	.....	
	.25	.37	.....	.....	3	.....	.....	.....	.....	
May 5	.25	.35	.....	.....	21	.....	.....	.....	.....	
	.21	.36	.....	.....	24	.....	.....	rate 12 m		
	.17	.39	.....	.....	27	.....	.....	.90	1.08	
	.17	.40	.....	.....	29	.....	.....	.87	1.0	
May 6	.18	.32	.....	.....	45½	.....	.....	.85	.78	
	.17	.22	rate 10 m.		46	rate 15 m.		.80	.73	
	.22	.25	.79	.49	51	1.02	.98	.71	.68	
	.18	.28	.80	.46	52	1.04	.93	.69	.67	
May 7	.12	.22	.81	.33	70	1.09	.79	.49	.62	
	.16	.24	.82	.43	71½	1.11	.74	.47	.60	
May 9	.12	.16	.67	.25	117	.54	.61	.35	.75	
	.11	.18	.63	.22	121	.53	.69	.....	.....	
	.04	.23	.62	.22	123½	.52	.67	.....	.....	
May 10	.10	.17	.50	.24	141½	.....	.....	.....	.....	
	.08	.21	.50	.22	143½	.....	.....	.....	.....	
	.08	.18	.48	.22	147½	rate 5 m		rate 12 m		
May 11	.05	.19	.42	.24	166	.37	.....	.77	.....	
	.07	.16	.41	.24	168	.37	.....	.75	.....	
	.07	.15	.40	.23	172	.36	.....	.75	.....	
May 12	.07	.17	.38	.24	189½	.35	.....	.82	.....	
	.09	.16	.39	.24	192	.33	.....	.78	.....	
	.09	.16	.42	.25	196½	.33	.....	.71	.....	
May 13	.08	.16	.....	.....	214½	.46	.....	.47	.....	
	.....	.....	rate 10 m		216	.30	.....	.45	.....	
	.10	.14	.85	.50	220	.29	.....	.42	.....	
May 14	.10	.13	.81	.43	237½	.23	.....	.38	.....	
	.09	.13	.81	.42	240	.22	.....	.39	.....	
May 16	.08	.15	.55	.22	286½	.15	.....	.....	.....	
	.10	.11	.52	.20	288	.15	.....	.....	.....	
	.09	.14	.49	.20	292½	.16	.....	.88	.....	
May 17	.11	.45	.38	.19	310	.16	.....	.80	.....	
	.11	.20	.37	.18	311½	.17	.....	.82	.....	
	.21	.07	.38	.20	316½	.16	.....	.80	.....	All out after a
	.....	.....	.30	.70	333½	.15	.....	.80	.....	storm from S.W.

EXPERIMENTAL STATION.

Sand Filters.—Appendix F.

Resistance Loss of Head (in feet) for 1 Foot of Sand.

Date.	Tank A			Tank B			Tank C			Tank D			Remarks.
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	
1910													
May 21..	.62	.01	4.0	1.28	.83	3.19	....	.94	3.39	....	.90	3.43	
May 23..	.59	.89	3.60	1.10	.76	2.95	....	....	....	....	....	....	
	....	....	....	.92	.80	2.75	....	.30	2.99	....	.5	3.37	
	....	....	....	.77	.57	2.52	....	....	....	....	....	....	
May 25..	.30	.27	2.40	....	.6	.47	....	....	....	....	....	....	
	.30	.28	2.28	....	....	....	....	....	....	....	....	....	
	.37	.32	2.12	....	....	....	....	....	....	....	....	....	
May 26..	.20	.30	1.30	....	....	....	....	1.02	3.67	....	.50	4.31	
	....	....	....	....	....	....	....	1.06	3.43	....	.52	4.37	
	....	....	....	....	....	....	....	1.05	3.77	....	.51	4.27	
May 27..	....	....	....	....	....	....	....	1.08	3.69	....	.50	4.19	
	....	....	....	....	....	....	....	1.10	3.47	....	.48	4.04	
	....	....	....	.5	.88	3.97	....	1.08	3.22	....	.50	3.96	
May 28..	.41	.37	4.15	.12	1.49	3.08	....	1.02	2.19	....	.46	3.41	
	....	....	....	.52	.86	4.05	....	....	3.08	....	.45	3.30	
May 30..	.28	.32	3.83	.31	.72	3.98	....	....	....	....	.37	1.76	} Incorrect, C resting
	.32	.29	4.18	.26	.67	3.83	....	.37	3.36	...	....	.....	Start after rest
May 31..	.30	.20	3.50	.30	.55	3.14	....	.36	2.83	....	....	.....	
	.27	.23	3.85	.30	.54	3.09	....	.34	2.67	....	....	.....	
	.25	.20	3.77	.30	.50	2.87	....	.33	2.57	....	....	.....	
June 1..	.35	.16	3.34	.28	.44	2.29	....	.32	2.37	....	.90	3.87	
	.30	.13	3.25	.30	.43	2.39	....	.34	2.23	....	.93	3.72	
	.21	.19	3.25	.30	.44	2.27	....	.29	2.15	....	.90	3.47	
June 2..	.19	.17	2.49	.38	.24	.99	....	.23	1.3	....	....	.....	
	.18	.15	2.42	....	....	....	....	....	....	....	....	.....	
June 3..	.16	.15	2.27	....	....	....	....	....	....	....	....	.....	
	.14	.18	2.20	....	....	....	....	....	....	....	.90	3.71	
	.17	.13	2.13	.51	.88	4.05	....	....	....	....	.92	3.92	
	1.5	.14	2.22	....	.85	4.07	....	....	....	....	.88	3.87	
June 4..	.13	.16	2.10	....	.87	4.17	....	....	....	....	.77	3.58	
	.16	.13	2.02	....	.85	4.17	....	.10	3.59	....	.76	3.49	
June 6..	....	....	....	.17	.51	2.97	....	.40	1.17	....	....	.....	
	.26	.13	4.52	.23	.39	2.54	....	....	....	....	....	.....	
	....	....	....	.25	.37	2.37	....	....	....	....	.84	3.77	
June 7..	.27	.14	4.42	.24	.34	2.12	....	....	....	....	.80	3.69	
	.27	.15	4.40	.22	.33	2.07	....	....	....	....	.78	3.65	
	.24	.14	4.39	.25	.30	1.87	....	1.10	3.73	....	.77	3.54	
June 8..	.21	.13	4.32	....	.30	.77	....	1.06	3.82	....	.56	2.45	
	.20	.16	4.28	....	....	....	....	1.03	3.73	....	.49	1.98	
	.21	.14	4.29	....	....	....	....	.92	3.49	....	.45	1.37	
June 9..	.16	.12	3.78	....	....	....	....	.65	2.73	....	....	.....	
	.18	.12	3.73	....	....	....	....	.65	2.72	....	....	.....	
	.16	.14	3.69	....	....	....	....	.64	2.62	....	....	.....	
June 10..	.17	.13	3.51	....	.85	3.92	....	.53	2.24	....	....	.....	
	.18	.11	3.40	....	.81	4.01	....	.47	1.79	....	....	.....	
June 11..	.23	.14	3.05	.40	.77	4.07	....	....	....	....	....	.....	
	.15	.11	2.81	.40	.74	4.03	....	....	....	....	....	.....	
June 13..	.12	.12	2.10	.30	.43	3.56	....	....	....	....	.73	3.86	
	.14	.12	1.86	.30	.38	3.42	....	....	....	....	.74	3.90	
	.13	.13	1.37	.27	.38	3.20	....	1.13	3.70	....	.82	3.69	
June *14..	.15	.15	1.31	.30	.32	2.89	....	1.18	3.57	....	.76	2.89	
	.16	.14	1.23	.32	.34	2.85	....	1.24	3.55	....	.75	2.73	
	....	.17	4.66	.34	.35	2.53	....	1.22	3.35	....	.70	2.33	
June 15..	.24	.18	4.26	.29	1.33	3.08	....	1.10	2.97	....	.70	1.42	
	.23	.20	4.10	.25	.37	2.04	....	1.20	3.07	....	....	.....	
	.21	.19	3.99	.26	.36	1.87	....	1.20	2.95	....	.77	4.17	
June 16..	.24	.16	3.56	.24	.36	1.13	....	1.15	2.32	....	.66	3.37	
	.24	1.18	3.52	.28	.35	1.02	....	1.20	2.22	....	.60	3.21	
	.21	.19	3.39	....	.40	.61	....	1.20	1.97	....	.53	2.37	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX F.

RESISTANCE LOSS OF HEAD (IN FEET) FOR 1 FOOT OF SAND.

Date	Tank A			Tank B			Tank C			Tank D			Remarks
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	
1910													
June 17..	.26	.17	2.60	....	....	.....	....	....	.....	....	....	.....	
	.35	.14	2.02	....	.34	4.29	....	1.16	4.13	....	.62	4.19	
June 18..	....	....	.....	.38	.32	4.09	....	1.10	3.66	....	.47	3.91	
	....	....	.....	.37	.32	4.05	....	1.06	3.49	....	.47	3.80	
June 20..	....	....	.....	.29	.21	2.47	....	....	.....	....	....	.....	
	....	....	.....	.42	.27	2.16	....	....	.....	....	....	.....	
	....	....	.....	.40	.29	1.11	....	....	.....	....	....	.....	
	....	.25	4.50	....	....	.....	....	....	.....	....	.58	4.19	Start after putting on strip
June 22..	.28	.24	4.54	....	....	.....	....	.93	4.09	....	.57	4.09	
	.28	.22	4.52	....	....	.....	....	.98	4.13	....	.57	3.96	
	.28	.22	4.42	....	.71	4.27	....	1.00	3.96	....	.57	3.78	
June 23..	....	.25	4.59	....	.80	4.37	....	1.06	3.79	....	.57	3.68	
	....	.26	4.60	....	.79	4.37	....	1.09	4.06	....	.58	3.69	
	....	.23	4.59	....	.88	4.39	....	.86	4.03	....	.60	2.72	
June 24..	....	.22	4.70	.31	.71	4.36	....	.99	3.94	....	.50	3.52	
	....	.22	4.70	.31	.69	4.36	....	.94	3.90	....	.47	3.49	
	....	.21	4.69	.30	.62	4.31	....	.92	3.87	....	.45	3.22	
June 25..	....	.19	4.64	.26	.62	4.11	....	.86	8.41	....	.47	2.56	
	....	.22	4.64	.27	.59	4.06	....	.84	3.31	....	.45	2.41	
June 27..	....	.17	4.69	.12	.38	2.66	....	....	.....	....	....	.....	
	....	.15	4.60	.15	.40	2.77	....	....	.....	....	....	.....	
	....	.15	4.65	....	.40	4.37	....	.51	4.04	....	.38	4.05	
June 28..	.24	.14	4.50	.39	.40	4.17	....	.50	3.57	....	.42	3.63	
	.23	.15	4.49	.39	.41	4.13	....	.50	3.52	....	.41	3.47	
	.23	.15	4.40	.66	.35	3.88	....	.50	2.98	....	.41	3.09	
June 29..	.21	.14	4.00	....	.38	3.66	....	....	.....	....	....	.....	
	.23	.14	4.26	....	.37	3.54	....	....	.....	....	....	.....	
June 30..	.21	.11	4.11	....	.35	3.13	....	....	.....	....	....	.....	
	.20	.12	4.12	....	.30	2.87	....	....	.....	....	....	.....	
July 2..	.20	.17	4.13	....	.47	1.73	....	....	.....	....	....	.....	
	.20	.16	4.13	....	.46	1.70	....	....	.....	....	....	.....	
July 3..	.21	.13	4.01	....	....	.....	....	.55	3.44	....	.41	3.77	
July 4..	.18	.13	3.62	....	....	.....	....	.54	3.19	....	.44	3.97	
	.20	.14	4.30	....	....	.....	....	.60	3.27	....	.47	3.34	
July 5..	.20	.12	3.96	....	....	.....	....	....	.....	....	.43	2.17	
	.18	.11	3.93	....	....	.....	....	....	.....	....	....	.....	
July 6..	.20	.10	3.85	....	....	.....	....	....	.....	....	....	.....	
	.17	.11	3.87	....	....	.....	....	....	.....	....	....	.....	
	.17	.10	3.82	....	.90	3.73	....	.79	3.44	....	.63	3.76	
July 7..	.17	.11	3.77	....	.80	3.62	....	.80	3.33	....	.60	3.61	
	.17	.10	3.75	....	.82	3.74	....	.80	3.22	....	.59	3.52	
	.17	.12	3.68	....	.79	3.51	....	.78	2.94	....	.58	3.15	
July 8..	.16	.10	3.63	....	.73	3.27	....	.79	1.97	....	.48	2.37	
	.16	.10	3.54	....	.76	3.17	....	.83	2.34	....	.54	1.94	
	.13	.12	3.62	....	.70	2.16	....	.80	2.04	....	.50	1.69	
July 9..	.20	.11	3.00	....	....	.....	....	....	.....	....	....	.....	
	.34	.11	3.61	....	....	.....	....	....	.....	....	....	.....	
July 11..	.17	.12	3.57	....	.75	4.04	....	....	.....	....	....	.....	
	.14	.12	3.42	....	.79	4.02	....	....	.....	....	....	.....	
	.17	.14	3.61	....	.81	3.74	....	....	.....	....	....	.....	
July 12..	.16	.13	3.69	....	.81	3.60	....	.97	3.19	....	.90	3.52	
	.17	.13	3.89	....	.75	3.55	....	.96	3.02	....	.96	3.27	
	.16	.10	4.02	....	.72	3.73	....	....	.....	....	1.00	2.42	
July 13..	.15	.18	4.02	....	.70	3.63	....	....	.....	....	....	.....	
	.17	.11	3.96	....	.74	3.43	....	....	.....	....	....	.....	
	.15	.14	3.87	....	.70	3.15	....	.98	2.65	....	.92	3.02	
July 14	.16	.13	3.84	....	.71	3.12	....	1.05	2.47	....	.96	2.51	
	.12	.12	4.02	....	.79	2.76	....	1.00	2.23	....	....	.....	
	.15	.10	3.95	....	.69	2.25	...	....	.....	....	....	.....	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX F.

RESISTANCE LOSS OF HEAD (IN FEET) FOR 1 FOOT OF SAND.

Date,	Tank A			Tank B			Tank C			Tank D			Remarks
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	
1910													
July 15..	.17	.13	3.64	....	.78	2.12	....	1.16	3.48	....	.97	3.74	
	.18	.12	3.70	....	.69	2.08	....	1.20	3.39	....	1.01	3.64	
	.16	.14	3.58	....	.....	.....	....	1.30	3.08	....	1.17	3.07	
July 16..	.15	.14	3.56	....	.....	.....	....	1.29	3.02	....	1.15	2.97	
	.13	.11	3.29	....	.....	.....	....	.....	.....	....	.....	.....	
July 18..	.18	.11	3.39	....	.....	.....	....	.....	.....	....	.....	.....	
	.15	.11	3.16	....	.83	3.95	....	1.32	3.40	....	1.06	3.61	
July 19..	.15	.11	3.09	....	.84	3.96	....	1.48	3.63	....	1.07	3.60	
	.13	.12	3.07	....	.85	3.97	....	1.48	3.63	....	1.04	3.56	
	.14	.10	3.14	....	.81	3.86	....	1.39	3.39	....	1.00	3.61	
July 20..	.15	.10	2.95	....	.78	3.70	....	1.19	3.20	....	.95	3.29	
	.14	.11	2.93	....	.78	3.69	....	1.16	3.14	....	....	3.2	
	.15	.11	2.78	....	.74	3.09	....	....	.....	....	.87	3.29	
July 21..	.14	.10	2.91	....	.66	3.25	....	....	.....	....	.81	2.71	
	.13	.11	2.86	....	.66	3.18	....	....	.....	....	.81	2.54	
	.14	.12	2.78	....	.63	2.99	....	....	.....	....	.82	2.54	
July 22..	.15	.12	2.40	....	.65	2.25	....	....	.....	....	....	.....	
	.16	.13	2.27	....	.69	2.13	....	....	.....	....	....	.....	
	.15	.12	2.11	....	.....	.....	....	1.44	3.47	....	1.08	3.69	
July 23..	.16	.12	1.65	....	.....	.....	....	.....	.....	....	1.13	3.56	
	.16	.13	1.56	....	.....	.....	....	.....	.....	....	.....	.....	
July 26..	....	....	....	....	.....	.....	....	1.35	1.64	....	1.10	3.62	
	.49	.32	4.34	....	.90	3.90	....	1.46	3.52	....	1.17	3.48	
July 27..	.45	.31	4.31	....	.93	3.91	....	....	.....	....	1.16	3.36	
	.44	.35	4.33	....	.94	3.92	....	....	.....	....	1.18	3.40	
	.45	.32	4.27	....	.92	3.95	....	....	.....	....	1.20	3.29	
July 28..	.41	.27	4.27	....	.94	3.86	....	....	.....	....	1.33	3.35	
	.41	.27	4.34	....	.94	3.88	....	....	.....	....	1.37	3.41	
	.37	.29	4.38	....	.92	3.89	....	....	.....	....	1.36	3.55	
July 29..	.34	.25	4.34	....	.95	3.76	....	....	.....	....	1.39	3.62	
	.34	.24	4.33	....	.90	3.77	....	....	.....	....	1.38	3.63	
	.33	.24	4.32	....	.90	3.68	....	....	.....	....	1.41	3.64	
July 30..	.30	.22	4.28	....	.89	3.38	....	....	.....	....	1.37	3.69	
	.28	.20	4.27	....	.86	3.40	....	....	.....	....	1.36	3.60	
Aug. 2..	.17	.11	4.23	....	.52	1.87	....	....	.....	....	1.34	3.69	
	.18	.14	4.14	....	.....	.....	....	....	.....	....	1.34	3.66	
	.18	.16	4.28	....	.....	.....	....	....	.....	....	1.30	3.59	
Aug. 3..	.20	.11	4.30	....	.....	.....	....	....	.....	....	1.34	2.21	
	.16	.12	4.25	....	.....	.....	....	....	.....	....	1.15	3.41	
	.16	.12	4.21	....	.84	4.06	....	1.31	3.77	....	1.10	3.30	
Aug. 4..	.14	.11	4.28	....	.80	4.11	....	1.40	4.01	....	.96	3.35	
	.18	.10	4.42	....	.81	4.15	....	1.36	4.03	....	.86	3.18	
	.16	.11	4.43	....	.80	4.21	....	1.29	3.99	....	.87	3.34	
	.15	.12	4.27	....	.87	4.12	....	1.43	3.82	....	.93	2.98	
Aug. 5..	.17	.12	4.24	....	.84	4.07	....	1.40	3.75	....	.91	2.85	
	.18	.08	4.21	....	.82	3.98	....	1.38	3.84	....	.87	2.90	
Aug. 6..	.15	.10	4.16	....	.80	3.64	....	1.28	3.48	....	.87	2.54	
	.18	.10	4.15	....	.79	3.85	....	....	.....	....	.84	2.48	
Aug. 8..	.14	.10	4.08	....	.62	3.41	....	....	.....	....	....	.....	
	.14	.08	4.07	....	.61	3.36	....	....	.....	....	....	.....	
Aug. 9..	.13	.08	4.07	....	.52	3.11	....	....	.....	....	....	.....	
	.15	.09	3.89	....	.48	2.99	....	....	.....	....	....	.....	
	.14	.10	3.98	....	.52	2.87	....	1.55	3.47	....	1.22	3 67	
Aug. 10..	.13	.10	4.07	....	.45	2.84	....	1.87	4.18	....	1.24	3 87	
	.13	.10	4.07	....	.44	2.83	....	1.92	4.21	....	1.25	3.86	
	.14	.09	4.02	....	.43	2.73	....	1.86	4.18	....	1.19	3.72	
Aug. 11..	.13	.10	3.95	....	.38	2.20	....	....	.....	....	1.21	3.55	
	.14	.09	3.93	....	.38	2.01	....	....	.....	....	1.22	3.43	
	.14	.06	3.82	....	.38	1.97	....	....	.....	....	1.20	3.30	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX F.

RESISTANCE LOSS OF HEAD (IN FEET) FOR 1 FOOT OF SAND.

Date.	Tank A			Tank B			Tank C			Tank D			Remarks.
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	
1910													
Aug. 12..	.03	.19	4.07	....	.34	1.77	....	....	....	....	1.21	3 07	
	.11	.09	3.89	....	....	....	....	....	....	....	....	.....	Stopped to fix overflow for 24 hours.
Aug. 13..	.49	.36	4.01	....	....	....	....	....	....	....	....	.....	
Aug. 15..	.34	.21	4.13	....	....	....	....	....	....	....	....	.....	
	.33	.20	4.16	....	....	....	....	....	....	....	....	.....	
	.31	.17	4.27	....	....	....	....	....	....	....	....	.....	
Aug. 16..	.28	.17	4.29	....	....	....	....	....	....	....	....	.....	
	.26	.16	4.30	.69	.32	4.07	....	1.00	4.14	....	1.03	3.87	
	.28	.14	4.02	....	.33	4.05	....	.76	3.23	....	1.00	3.62	
Aug. 17..	.20	.14	4 38	....	.28	3.49	....	.40	2.64	....	.65	3.32	Not reliable.
	.19	.14	4.14	....	.26	3.33	....	....	....	....	.63	3.16	
	.17	.10	4.22	....	.26	2.77	....	....	....	....	.54	2.63	
Aug. 18..	.15	.08	3.92	....	....	....	....	....	....	....	....	.....	
	.12	.10	3.89	....	....	....	....	....	....	....	....	.....	
	.10	.10	3 86	....	....	....	....	....	....	....	....	.....	
Aug. 19...	.12	.08	3.64										
	.13	.08	3.59										
	.11	.07	3.40										
Aug. 20..	.10	.09	3.27	....	....	....	....	....	....	....	....	.....	Sands all alike
Aug. 22..	.09	.06	3.22										Lake-washed sand.
	.10	.07	2.94										
Aug. 23..	.10	.06	2.36										
Aug. 30..	.14	.14	4.56	.15	.26	4.24	.15	.25	4.42	.17	.23	4.22	
	.15	.15	4.42	.19	.25	3.98	.17	.24	4.24	.22	.31	3.99	
Aug. 31..	.12	.17	4.27	.16	.21	3.80	.15	.20	4.07	.20	.20	3.73	
	.12	.15	4.25	.13	.21	3.77	.15	.23	4.12	.22	.22	3.66	
Sept. 1* ..	.10	.15	4.14	.14	.19	3.65	.18	.21	3.98	.19	.21	3.47	
	.11	.14	4.08	.16	.20	3.49	.14	.21	3.93	.20	.21	3.38	
	.10	.15	3.97	.19	.20	3.07	.17	.18	3.79	.20	.19	3.18	
Sept. 2..	.10	.15	3.75	....	.17	2.99	.15	.20	3.27	.19	.20	3.07	
	.11	.13	3.85	.13	.15	2.80	.13	.19	3.13	.16	.18	2.83	
Sept. 3..	.13	.10	3.94	.10	.16	2.77	.13	.18	3.19	.16	.18	2.87	
Sept. 4..	.15	.09	3.89	.10	.13	2.62	.11	.16	3.11	.16	.15	2.76	
Sept. 6..	.10	.14	2.92	....	.13	1.14	.11	.14	1.96	.13	.16	2.14	
	.09	.12	2.69	....	....	....	.10	.13	1.58	.13	.16	1.70	
	.10	.13	2.48	....	....	....	.09	.13	1.23	.18	.15	1.34	
Sept. 7..	.08	.09	3.17	....	....	....	....	....	....	....	....	.....	
	.07	.09	2.82	....	....	....	....	....	....	....	....	.....	
	.09	.09	2.60	....	....	....	....	....	....	....	....	.....	
Sept. 8..	.10	.10	2.14	....	.36	4.52	....	....	....	....	....	.....	
	.10	.11	2.11	.20	.36	4.17	....	....	....	....	....	.....	
	.09	.10	2.00	.22	.32	4.52	.10	.12	4.52	....	....	.....	
Sept. 9..	.10	.10	1.69	.23	.31	4.49	.13	.13	4.52	....	....	.....	
	.11	.09	1.62	.19	.31	4.48	.11	.15	4.54	....	....	.....	
	.09	.10	1.49	.18	.31	4.47	.12	.13	4.52	....	....	.....	
Sept. 10..	....	....	.....	.19	.26	4.32	.08	.13	4.39	....	....	.....	
	....	....	.....	.17	.29	4.45	.10	.17	4.55	....	....	.....	
Sept. 12..	....	....	.....	.12	.22	4.29	.12	.13	4.40	....	....	.....	
	....	....	.....	.11	.22	4.26	.11	.14	4.47	....	....	.....	
Sept. 13..	.22	.16	4.50	.11	.19	4.17	.09	.13	4.52	.26	.26	4.26	
	.23	.16	4.57	.10	.18	4.07	.12	.11	4.32	.27	.23	4.27	
	.20	.14	4.52	.13	.13	3.98	.10	.16	4.33	.20	.24	4.27	
Sept. 14..	.19	.13	4.23	.11	.16	4.28	.11	.13	4.44	.22	.26	4.34	
	.20	.17	4.68	.12	.13	4.10	.12	.12	4.34	.21	.25	4.26	
	.23	.13	4.62	.12	.12	3.89	.09	.15	4.27	.19	.23	4.21	
Sept. 15..	.16	.14	4.53	.11	.12	3.53	.12	.15	4.10	.17	.23	4.12	
	.14	.14	4.53	.11	.11	3.53	.11	.16	4.07	.19	.21	4.12	
	.14	.14	4.52	.09	.11	3.52	.11	.15	4.06	.16	.21	4.12	

EXPERIMENTAL STATION.

Sand Filters.—Appendix F.

Resistance Loss of Head (in feet) for 1 Foot of Sand.

Date.	Tank A			Tank B			Tank C			Tank D			Remarks
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	
1910													
Sept. 16..	.15	.10	4.48	.10	.12	3.42	.12	.13	4.07	.16	.20	4.12	
	.12	.12	4.50	.10	.14	3.34	.10	.13	4.05	.15	.20	4.11	
	.15	.12	4.45	.11	.14	3.26	.10	.12	3.98	.17	.15	4.08	
Sept. 17..	.17	.09	4.41	.10	.13	3.06	.09	.12	3.08	.14	.15	4.11	
	.12	.11	4.43	.10	.13	2.98	.11	.15	4.05	.13	.17	4.11	
Sept. 19..	.15	.13	4.23	.10	.12	2.11	.10	.13	3.53	.11	.14	3.97	
	.15	.12	4.16	.09	.14	1.89	.09	.14	3.40	.12	.13	4.08	
Sept 20..	.14	.11	3.75	....	....	.....	.09	.13	2.65	.10	.12	3.57	
	.13	.11	3.65	....	....	.....	.08	.13	2.00	.10	.15	3.37	
Sept. 21..	.13	.11	3.61	....	....	.....	....	.16	2.17	.18	.09	3.21	
	.12	.14	3.57	....	....	.....	.10	.14	2.22	.11	.14	3.21	
Sept. 22..	.13	.11	3.10	....	....	.....	.10	.13	1.45	.11	.13	2.45	
Sept. 23..	.10	.17	3.00	....	....	.....	.11	.16	1.26	.19	.05	2.24	
	.22	.11	2.84	.15	.15	4.57	....	....	.....	.15	.15	1.87	
Sept. 24..	.11	.13	2.88	.14	.20	4.47	....	....	.....	.10	.17	1.87	
	.12	.10	2.60	.09	.20	4.45	....	....	.....	.11	.14	1.42	
Sept. 26..	....	....	.....	.29	.20	3.32	....	....	.....	....	....	.....	
	....	....	.....	.24	.20	3.33	.25	.30	4.21	....	....	.....	
Sept. 27..	....	....	.....	.21	.18	3.17	.25	.35	4.32	....	....	.....	
	....	....	.....	.19	.15	3.09	.24	.31	4.27	.28	.35	4.32	
Sept. 28..	....	....	.....	.14	.16	3.18	.22	.28	4.12	.33	.31	4.38	
Sept. 29..	....	....	.....	.16	.17	3.16	.25	.30	4.22	.22	.30	4.22	
	....	....	.....	.04	.15	3.14	.16	.27	4.12	.09	.33	4.22	
Sept. 30..	....	....	.....	.13	.17	2.92	.14	.20	4.02	.15	.27	3.74	
	.30	.25	4.43	.14	.13	2.58	.11	.18	3.56	.15	.26	4.11	
Oct. 1....	.26	.23	4.62	.11	.16	2.78	.13	.15	3.79	.13	.22	3.99	
Oct. 3....	.23	.21	4.21	....	....	.....	.10	.15	3.20	.24	.19	3.83	
	.21	.21	4.19	.26	.39	4.36	.14	.10	3.22	.20	.20	3.87	
Oct. 4....	.20	.18	4.20	.23	.39	4.47	.13	.15	3.47	.19	.16	3.61	
	.21	.18	4.20	.23	.30	4.07	.11	.13	3.21	.23	.16	3.91	
Oct. 5....	.24	.17	4.11	.24	.34	4.42	.10	.15	2.02	.20	.17	3.67	
	.19	.18	4.15	.16	.33	4.05	.12	.13	2.35	.20	.15	3.62	
Oct. 7....	.18	.15	4.02	.17	.27	4.22	.14	.16	1.85	.21	.15	3.41	
	.18	.13	3.92	.17	.26	4.00	.12	.14	1.55	.19	.17	3.26	
Oct. 8....	.17	.13	3.75	.17	.23	4.22	.12	.14	1.24	.20	.18	2.97	
Oct. 10...	.15	.15	3.70	.14	.20	4.07	....	....	.....	.20	.17	2.51	
Oct. 11...	.15	.15	3.65	.14	.20	4.04	....	....	.....	.19	.16	2.27	
	.17	.15	3.57	.14	.20	3.95	....	....	.....	.21	.16	2.03	
Oct. 12...	.14	.17	3.51	.16	.20	3.89	Rate	10 Mi	ll Call	.26	.14	1.79	
	.16	.14	3.35	.16	.21	3.79	.56	.69	3.52	.23	.17	1.54	
Oct. 13...	.16	.14	3.22	.14	.21	3.75	.50	.71	3.87	....	....	.....	
	.16	.15	3.08	.16	.20	3.69	.51	.68	3.76	....	....	.....	
Oct. 14...	.15	.12	3.00	.13	.20	3.68	.42	.67	3.65	....	....	.....	
	.20	.11	2.69	.15	.20	3.30	.36	.61	4.02	.57	.86	3.61	
Oct. 17...	.11	.18	2.29	.16	.19	3.16	.32	.21	3.62	.46	.86	3.79	
	.10	.17	2.14	.16	.16	3.07	.30	.31	3.52	.42	.89	3.74	
Oct. 18...	.08	.19	1.91	.14	.19	2.88	.27	.30	3.17	.40	.74	3.25	
	.14	.14	1.84	.15	.19	2.86	.25	.32	3.14	.37	.71	3.37	
Oct. 19...	.24	.06	1.77	.15	.19	2.86	.26	.28	2.95	.36	.50	3.01	
Oct. 20...	.20	.09	1.80	.16	.19	2.74	.27	.32	2.79	.34	.43	2.80	
Oct. 21...	....	....	.....	.16	.20	1.99	....	....	.....	....	....	.....	
Oct. 24...	.61	.60	4.04	....	....	.....	....	....	.....	....	....	.....	
	.62	.57	3.88	.52	.76	3.20	.58	.72	3.21	.72	.80	3.37	
Oct. 25...	.50	.55	3.90	.49	.76	3.69	.55	.75	3.67	.86	.84	3.21	
	.41	.55	4.09	.46	.77	3.76	.51	.73	3.67	.84	.84	3.12	
Oct. 26...	.35	.45	3.70	.41	.74	3.67	.47	.71	3.55	1.05	1.00	1.65	
	.39	.36	3.80	.40	.70	3.72	.41	.74	3.41	....	....	.....	
Oct. 27...	.35	.36	2.40	.32	.50	3.32	.29	.57	2.61	....	....	.....	
	.37	.33	2.83	.28	.43	2.91	.25	.51	2.10	....	....	.....	

EXPERIMENTAL STATION.

SAND FILTERS.—APPENDIX F.

RESISTANCE LOSS OF HEAD (IN FEET) FOR 1 FOOT OF SAND.

Date.	Tank A			Tank B			Tank C			Tank D			Remarks.
	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd	1st	2nd	Head over 2nd.	1st	2nd	Head over 2nd	
1910													
Oct. 28...	....	....	.....	.26	.36	1.68	....	....	.....	.79	.76	3.33	
Oct. 29...	....	....	.....	....	....	.....	....	....	.....	.70	.91	3.57	
Nov. 1....	.36	.33	3.04	.34	.38	2.59	.40	.50	3.47	.78	.81	3.35	
	....	....	.....	....	....	.....	.31	.40	2.00	.84	.86	3.38	
Nov. 2....	....	....	.....	....	....	.....	....	....	.....	.88	.81	3.17	
	....	....	.....	....	....	.....	....	....	.....	.89	.77	3.02	
Nov. 4....	.64	.74	3.91	.55	.50	3.83	.66	.97	2.86	....	....	.....	
	.55	.75	3.74	.55	.50	3.79	.65	.97	3.24	.96	1.04	3.06	
Nov. 5....	.33	.52	2.49	.39	.43	3.11	....	....	.....	....	....	.....	
Nov. 8....	....	....	.....	.72	.78	3.25	.72	1.07	3.66	.96	1.02	3.23	
	.81	.73	3.80	.70	.74	3.02	.71	1.01	3.35	.86	.99	2.84	
Nov. 9....	.71	.77	3.79	.73	.79	3.16	.65	1.07	3.71	1.02	1.08	2.97	
	.68	.74	3.34	.68	.75	2.64	.56	1.02	2.32	....	....	.....	
Nov. 10...	.50	.67	2.57	....	....	.....	....	....	.....	....	....	.....	
	.43	.65	2.00	....	....	.....	....	....	.....	Rate	3 Mil	Calls	
Nov. 11...	....	....	.....	....	....	.....	....	....	.....	.44	.43	4.28	
Nov. 12...	.28	.25	4.62	.24	.34	4.13	....	....	.....	.26	.33	4.20	
Nov. 14...	.19	.24	4.73	.21	.30	4.48	.19	.27	3.47	.21	.27	3.35	
	....	....	.....	.20	.30	4.37	.17	.20	1.79	.36	.24	4.31	
Nov. 15...	....	....	.....	.15	.30	4.59	....	....	.....	.36	.33	4.31	
Nov. 16...	....	.25	4.79	.15	.28	4.59	....	....	.....	....	.28	4.32	
Nov 17...	....	.15	4.70	.13	.23	4.56	.30	.39	4.28	.36	.27	4.28	
	.18	.09	4.61	.12	.27	4.59	.27	.34	4.38	.35	.28	4.26	
Nov. 18...	.10	.14	4.65	.10	.17	4.51	.26	.34	4.41	.34	.29	4.11	
Nov. 19...	.10	.12	4.52	.10	.16	4.44	.22	.29	4.51	.28	.26	4.17	
Nov. 21...	.13	.08	4.45	.12	.13	4.22	.15	.28	4.47	.20	.22	3.76	
	.09	.13	4.47	.11	.12	4.29	.14	.28	4.45	.25	.22	3.64	
Nov. 22...	.10	.11	4.35	.11	.15	4.08	.15	.21	4.39	.18	.13	3.06	
Nov. 23...	....	.20	4.32	.11	.10	3.99	.13	.18	4.35	.17	.14	3.32	
Nov. 24...	....	.11	4.04	.11	.13	3.91	.12	.17	4.29	.15	.17	3.13	
	....	.13	3.96	.10	.12	3.75	.12	.18	4.07	.52	.16	2.75	
Nov. 25...	....	.11	3.87	.12	.13	3.83	.14	.15	4.32	.31	.17	2.97	
	.08	.13	3.86	.11	.12	3.83	.13	.16	4.32	.35	.15	2.92	
	....	.13	3.66	.11	.13	3.69	.12	.16	4.15	.78	.15	2.49	
Nov. 28...	.43	.12	3.26	.11	.13	3.30	.13	.13	3.95	....	.14	1.97	
Nov. 29...	....	.14	2.16	.10	.11	1.78	.10	.13	3.15	....	....	.....	
Dec. 1...	....	....	.....	....	....	.....	.10	.14	2.12	....	....	.....	
Dec. 2...	....	....	.....	....	....	.....	.10	.14	1.33	.08	.39	4.28	Not reliable.
Dec. 3...	....	.25	4.64	....	....	.....	....	....	.....	....	....	.....	
Dec. 5...	....	.23	4.60	.20	.36	4.46	....	....	.....	....	.35	4.35	
	....	.21	4.74	.18	.35	4.49	....	....	.....	....	.29	4.25	
Dec. 6...	.20	.19	4.62	.18	.30	4.41	.21	.32	4.24	.29	.25	4.12	
Dec. 7...	.17	.15	4.31	.18	.24	4.26	.31	.41	4.03	.33	.27	4.10	
Dec. 8...	.17	.16	4.10	.15	.22	4.08	.27	.35	3.60	.31	.18	3.74	
Dec. 9...	.15	.10	3.91	.13	.18	3.95	.20	.27	3.72	.32	.20	3.57	
Dec. 10...	.17	.11	3.72	.15	.15	3.82	.15	.31	3.30	....	.21	3.41	
Dec. 14...	.27	.15	1.85	....	....	.....	.31	.39	4.35	.40	.17	2.14	
Dec. 16...	....	.28	4.59	.31	.42	4.35	.27	.26	4.15	....	....	.....	
Dec. 19...	.20	.20	4.58	.20	.29	4.39	.18	.26	4.32	.38	.40	4.17	
Dec. 22...	.20	.12	4.42	.15	.16	4.37	.16	.19	4.31	.12	.28	4.27	
Dec. 27...	.21	.13	3.98	.17	.16	3.92	.15	.15	3.98	.30	.24	3.99	
Dec. 30...	.23	.13	3.77	.17	.17	3.85	.15	.14	4.01	.06	.19	3.71	
Jan. 5....	.22	.13	3.52	.14	.18	3.34	.13	.17	3.97	.21	.20	3.46	

PROVINCIAL BOARD OF HEALTH OF ONTARIO

EXPERIMENTAL STATION.

Chemical Analysis.

Tank.	Date.	Free NH_3	Alb. NH_3	Nitrites and Nitrates.	Total Solids.	Susp. Solids.	Diss. Solids.	Total Hard.	Temp. Hard.	Perm. Hard.	Diss. Oxy.	Turby.	Chloride.	Remarks.
Tap ..	Sep. 15–Dec. 4.	.006	.0875	....	.0156	....	.0156	135.0	96.7	25.6	9.3	21.8	8	
A	" "	.007	.095	....	.0155	....	.0155	117.1	101.7	17.5	10.2	1.25	8	
B	" "	.013	.095	....	.0161	....	.0161	119.6	96.0	23.1	10.25	1.5	8	
C	" "	.0106	.096	....	.0160	....	.0160	118.0	95.0	22.0	10.0	1.8	8	
D	" "	.005	.094	....	.0169	....	.0169	120.8	95.0	27.2	10.0	1.8	8	
Tap ..	Sep. 15–22....	.025	.085	....	.0167	....	.0167	125.0	99.0	26.0	.....	....	..	
	Sep. 25–Oct. 4.	.....	.11	....	.0157	....	.0157	126.0	97.5	....	.....	....	..	
	Oct. 4–12	.....	.07	....	.....	....	.....	144.0	.....	....	.....	....	..	
	" 12–16	.....	.03	....	.0169	....	.0169	144.0	.....	....	.....	....	..	
	" 26–Nov. 2..	.....	.105	....	.0135	....	.0135	111.0	100.0	16.0	.....	....	8	
	Nov. 5–10.....	.....	.11	....	.0155	....	.0155	121.0	92.0	29.0	.....	....	..	
	" 11–18.....	.....	.09	....	.....	....	.....	130.0	98.0	32.0	9.3	8.7	..	
	" 29–Dec. 4..	.025	.10	....	.....	....	.....	119.0	94.0	25.0	.....	35.0	..	
		.006	.0875	....	.0156	....	.0156	135.0	96.7	25.6	9.3	21.8	8	
A	Sep. 15–22	.....	.08	....	.0158	....	.0158	120	102	18	.....	....	8	
	" 25–Oct. 4 .	.....	.065	....	.0163	....	.0163	103.5	99.5	....	.....	....	8	
	Oct. 4–12	.03	.115	....	.....	....	.....	129.5	.....	....	.....	....	..	
	" 12–16	.....	.065	....	.0168	....	.0168	116.0	.....	....	.....	....	..	
	" 26–Nov. 2.	.....	.115	....	.0145	....	.0145	119.0	110.0	19	.....	....	8	
	Nov. 5–10	.....	.13	....	.0143	....	.0143	113.0	90.0	23	.....	....	8	
	" 11–18	.025	.095	....	.....	....	.....	119.0	109.0	10	9.7	1.5	..	
	" 29–Dec. 4.	.....	.....	....	.....	....	.....	.....	.....	....	10.7	1.0	..	
		.007	.095	....	.0155	....	.0155	117.1	101.7	17.5	10.2	1.25	8	

Dissolved Solids in Grams per 100cc., other quantities in parts per million.

EXPERIMENTAL STATION.

Chemical Analysis.

Tank.	Date.	Free NH_3	Alb. NH_3	Nitrites and Nitrates.	Total Solids.	Susp. Solids.	Diss. Solids.	Total Hard.	Temp. Hard.	Perm. Hard.	Diss. Oxy.	Turby.	Chlorine.	Remarks.
B	Sep. 15–22	.....	.08	....	.0154	....	.0154	123.5	100.0	23.5	.....	....	..	
	" 25–Oct. 4.	.015	.12	....	.0155	....	.0155	107.5	97.0	....	.....	....	..	
	Oct. 4–12	.....	.074	....	.....	....	.....	139.5	.....	....	.....	....	..	
	" 12–16.....	.....	.065	....	.0166	....	.0166	114.0	.....	....	.....	....	..	
	" 26–Nov. 2..	.015	.13	....	.0186	....	.0186	119.0	97.0	22.0	.....	....	8	
	Nov 5–10.....	.07	.13	....	.0146	....	.0146	123.0	89.0	34.0	.....	....	..	
	" 11–18.....	.....	.08	....	.....	....	.....	109.0	99.0	10.0	10.7	1.5	..	
	" 29–Dec. 4.	.01	.085	....	.....	....	.....	120.0	94.0	26.0	9.8	1.6	..	
		.013	.095	....	.0161	....	.0161	119.6	96.0	23.1	10.25	1.5	8	
C	Sep. 15–22	.04	.095	....	.0163	....	.0163	119.0	99.0	20.0	.....	....	..	
	" 25–Oct. 4.	.....	.115	....	.016	....	.016	113.0	97.0	....	.....	....	..	
	Oct. 4–12	.....	.065	....	.....	....	.....	132.8	.....	....	.....	....	..	
	" 12–16.....	.01	.065	....	.0170	....	.0170	116.0	.....	....	.....	....	..	
	" 26–Nov. 2.	.....	.105	....	.0163	....	.0163	110.0	97.0	13.0	.....	....	8	
	Nov. 5–10	.....	.125	....	.0148	....	.0148	119.0	90.0	29.0	.....	....	..	
	" 11–18	.01	.09	....	.....	....	.....	111.0	97.0	14.0	10.0	1.3	..	
	" 29–Dec. 4.	.025	.11	....	.....	....	.....	124.0	90.0	34.0	.....	2.3	..	
		.0106	.096	....	.0160	....	.0160	118.0	95.0	22.0	10.0	1.8	8	
D	Sep. 15–22	.....	.08	....	.0154	....	.0154	118.0	95.0	23.0	.....	....	..	
	" 25–Oct. 4.	.015	.11	....	.015	....	.015	109.0	97.5	....	.....	....	..	
	Oct. 4–12	.....	.065	....	.....	....	.....	132.9	.....	....	.....	....	..	
	" 12–16	.....	.045	....	.....	....	.....	116.0	.....	....	.....	....	..	
	" 26–Nov. 2.	.025	.114	....	.0218	....	.0218	123.0	98.0	25.0	.....	....	8	
	Nov. 5–10.....	.01	.20	....	.0154	....	.0154	120.0	91.0	29.0	.....	....	..	
	" 11–18.....	.....	.07	....	.....	....	.....	127.0	98.0	29.0	10.0	2.0	..	
	" 29–Dec. 4.	.....	.07	....	.....	....	.....	121.0	91.0	30.0	.....	1.7	..	
		.005	.094	....	.0169	....	.0169	120.8	95.0	27.2	10.0	1.8	8	

Dissolved **Solids** in Grams per 100cc., other quantities in parts per million.

APPENDIX "A."

The reports appearing in this Appendix were received from the Secretaries of the different Local Boards of Health of the cities and towns of the Province, in conformity with section 60 of the Public Health Act, and have been edited by the Secretary of the Board.

BERLIN.

DR. J. MCGILLAWEE, M.O.H.

I beg to submit the report of the Medical Health Officer for the year 1912.

There has been a marked decrease in the number of contagious diseases from the previous year.

There were nineteen case of Diphtheria, with four deaths.
Eighteen case of Scarlet Fever, with two deaths.
One death from Bronchitis following measles.
Eight cases of Typhoid, with three deaths.
There were eight deaths from Tuberculosis. Three cases of Tuberculosis at present.

The milk supply has been on the whole good during the year. It is being impressed on the Milk Dealers that strict attention must be paid to cleanliness in the handling of the milk, referring particularly to the producer.

The water supply was contaminated for a short time, but the last report from the Provincial Laboratory pronounced the water pure. In connection with the water supply, I would recommend the establishing of flowing fountains in the schools.

JOHN F. MCKAY, CHAIRMAN, L.B.H.

Pursuant to Sec. 3, of schedule B, of the Public Health Act, I present you with a report, containing a detailed statement of the work of the Local Board during the year 1912, also the report of the sanitary condition of the municipality, as rendered to the Board by the Medical Officer of Health.

The attendance of the members of the Board at the Regular Meetings held during the year, with little exception, has been very good. It is worthy of notice that without exception the Board is composed of gentlemen of a high grade of intelligence, and while every item of business has been conducted with a strict view to economy, yet every proposition for the promotion of the public health, as well as the protection of the peeople against disease, has no suffered on account of parsimony.

Commendable efforts have been put forth by the Board to eradicate as far as practicable all out-door water closets, and establish instead proper sewer connection. On account of an imperfect system of sewer connection inspection, many connections heretofore have been improperly made, for which the city pays the penalty of insanitary conditions. As many as possible of these unsuitable connections have been located and remedied, and a system of inspection instituted, which will be a safeguard against a recurrence of similar blunders in the future.

Particular attention has been given to the inspection of milk, the health of various dairies supplying milk to the City, as well as the sanitary condition of the stables has been looked after, and a printed code of rules, regulations and recommendations, furnished by the Department of Health, to all owners of cows furnishing milk to the City.

The Medical Officer of Health whose duty it is to inspect the milk assisted by the Sanitary Inspector, is supplied with a Babcock tester which gives the per cent. of butterfat contained in the milk. This gentleman is also supplied with an ingenious modern invention made in Chicago by means of which milk may be forced through a prepara tion of cotton, thus determining its purity or the reverse. The Medical Officer of

Health has also attended the Ontario Agricultural College on various occasions for the purpose of acquiring a scientific knowledge of the operation of these appliances, so that any official tests made by him in this line may safely be considered authoritative.

The Board has experienced considerable difficulty in dealing with the chicken problem. There is no very explicit law governing the location of chicken pens, consequently about the only way that any protection can be afforded to those who suffer in this respect is when the location of a chicken pen can be shown to be a nuisance.

The Isolation Hospitals are in proper condition and supplied with fuel, light and water, together with cots, bedding, cooking stoves, utensils, etc., and other appliances requisite for the care of those afflicted with contagious diseases.

Two cases of measles were accommodated in the Smallpox shack in the early part of summer. These were young men from Fort William, who were put off a Grand Trunk train and had to be provided for at the Isolation Institution. There was little or no expense in this connection, as the young men in question waited on themselves and found their own board.

There are at the present time several cases of malignant diphtheria being treated in the Isolation Hospital, necessitating the employing of two qualified nurses. The Medical Officer of Health and the Sanitary Inspector are both putting forth commendable efforts towards stamping out the disease, and especially in endeavoring to prevent the spreading of the contagion.

The matter of a supply of pure ice has been a perplexing problem, especially during the year 1912. The supply has been harvested for years from Victoria Lake, but on account of a vast accumulation of deleterious matter in the bed of the lake, the Local Board, advised by the Provincial Board, will forbid the harvesting and sale of ice from this source for domestic purposes.

BRANTFORD.

DR. F. G. E. PEARSON, M.O.H.

Herein I present you a brief report of the department for the year ending October, 31st, 1912.

MORTUARY STATISTICS.

For the period comprising this report there have occurred—exclusive of 22 still-births—257 deaths, which to the population as given by the assessors' returns, 25,337, gives a mortality rate of 10.10 per thousand. This in itself is very gratifying as being the lowest of any previous death rate, and as compared with the preceding twelve months shows also a decided decrease, for in 1910-1911 the rate was 12.5.

As to causes of deaths we find:

Tuberculosis	21
Pneumonia	28
*Typhoid Fever	8
Diphtheria	1
Whooping Cough	5
Meningitis	9
Cholera Infantum and Intestinal diseases of children	26

*This includes hospital report, of which there were seven from outside.

As to ages.—We find that 84 deaths occurred under 1 year.

19	"	between 1 year and five years.
79	"	over 60 years.
34	"	over 80 years.

Therefore, notwithstanding the fact that a great many had passed the three score years and ten, there were also a large number that occurred under the one year mark and as previously recorded no less than 26 of these infantile deaths were due to intestinal diseases which take place particularly during the summer months.

This is one of the matters that demand our attention, for no doubt the large percentage of these cases is directly due to improper and unsanitary methods of dealing with the food of the child, and among the prominent causes I think we can place the unsanitary feeding bottles and the improper care of the milk from which they are infected.

This is an important question and should demand the attention of all mothers in seeing that absolute sterilization be done to both the food and the vessel in which it is contained. This with the proper hygiene of the child would, I think, reduce this mortality very materially.

It is here where I can see a good field for the operation of a visiting nurse who could give the proper instruction, etc., and a department which I think should soon be inaugurated by the Board.

Contagious Diseases.

During the past twelve months there have been reported at this office, in all 115 cases of contagion, which in comparison with the previous year—140 cases—is a very satisfactory decrease, and were as follows:

Diphtheria

Of this disease there were in all 18 cases with one death, as compared with 22 cases with four deaths for the preceding year.

Scarlet Fever.

Of Scarlet Fever there were 26 cases with no deaths, as to 34 cases with no deaths for the corresponding period of 1910-1911.

Typhoid Fever.

As with the preceding, we are also pleased to record a decided decrease in typhoid from the City for the past year. There were in all 24 cases reported, 7 of which were from outside sources, with one death, as compared with 55 cases and 8 deaths for the preceding year. And here again I wish to make some explanation. As noted in a previous part of the report, we are credited with 8 deaths from typhoid, of this number but one was from cases occurring in the city, the other 7 were in cases reported from the hospital, and we find cases occurring outside the city but were treated in the hospital, and thus the deaths were reported in the municipality. We get the credit of these, whereas but one should be registered against the cases occurring in the city.

Smallpox.

Of this disease we had 3 cases with no deaths, the cases were directly traceable to an outside source, being contracted at a summer resort.

Measles, Whooping Cough, etc.

Of these we had recorded in all 44 cases, with 6 deaths, 5 of these being registered against Whooping Cough, and one due to Measles.

Tuberculosis.

As this disease has now come under the class of a reportable disease, it is to be hoped that we may be able, therefore, to get some better results as to its care, etc.

The deaths for the year as before stated were 21, an increase over last year, when we had but 14.

As regards the treatment of this class of disease up to the present, we have been sadly handicapped, but I am pleased to report that the object for which we have so long striven is about now to be realized, viz.: I am pleased to report that the sanitarium for this class of disease is now in process of construction, and will, I am certain, be a great advantage to the city, both in the care of, and the educational influence it will have in reducing this dreaded trouble.

Public Abattoir.

In this matter which has so frequently been brought to your attention, I am again compelled to emphasize as an absolute necessity for the protection of the citizens in the way of obtaining a pure and wholesome meat supply. The arguments that have before been used in its favor are daily being confirmed, and without going over them again, I will merely mention the facts that so frequently occur in the results of the market inspector's vigilance, which outside the means of a proper meat inspection—which alone can be had in a public abattoir, he has been able to show the public that much diseased meat is publicly offered for sale upon the public market alone, beside which the slovenly and insanitary way in which the products are frequently handled should demand that some effort should be put forth to gain a means whereby pure food could be guaranteed to the consumer.

I have also to recommend for your consideration that some proper and more modern structure be provided for the care of contagious disease. I here refer particularly to an increase in capacity of our present Isolation Hospital which I hope in the proposed extension of the General Hospital will be considered favorably. But, the most crying need is that a proper and modern structure be constructed for the care of smallpox, the present structure having outworn its usefulness.

Another matter which I propose for your approval is additional help in the sanitary work, for at least the summer months, for with one sanitary Inspector it is absolutely impossible to make the proper house to house inspections that should be made, for with routine work, one man cannot find time to make house to house rounds, and, thus, I am quite sure that from April to November an extra Inspector could be very profitably employed; also, I think that it is decidedly in the interest of the health of the community that an ordinary Inspector be employed to look after the dairies and slaughter houses at various times during the season. This of course has been done on occasions, and from the reports of such, I am certain much good can be accomplished to have this done systematically and regularly.

CHATHAM CITY.

Dr. W. R. Hall, M.O.H.

I herewith submit my annual report for the year ending Nov. 30th, 1912.

Contagious Diseases.

We have enjoyed exceptional freedom from all contagious diseases during the year.

Scarlet Fever—Three cases in November, 1912, from three distinct points of infection, all recovered.

Diphtheria.—Four cases, three in December, 1911, and one in February, 1912, two of the cases in December 1911 ended fatally.

German Measles.—Two cases.

Typhoid Fever.—Twenty-two cases, one death.

Tuberculosis.—No cases reported, although twelve deaths were reported from this cause.

Vital Statistics.

Total deaths registered 202, of these 47 were non-residents who died in the City hospitals, leaving 155 deaths of residents. Death rate 14.2.

Births.—194, Males 105, Females 89; rate 17.6.

Marriages.—190.

Full advantage was not taken of many provisions in the New Health Act, though much was done in an Educational way which will prepare our citizens for its enforcement next year, I refer especially to the clause requiring all horse manure and stable refuse to be kept in closed boxes, for the purpose of mitigating the fly propagating nuisance.

Milk.

A new By-law was passed during the year and a very good Laboratory equipped for the examination of milk. A great many samples of milk from various sources were examined with the object of establishing an average content for butter-fat and total solids; these examinations fully establish the fairness of the standards required by the Milk By-law recently passed.

GUELPH.

Dr. H. O. Howitt, M.O.H.

The following is report for the year ended November 30th, 1912.

Mortality.

There occurred in the City of Guelph during the year 209 deaths, a decrease of 2 from the previous year. Although these deaths occurred actually within the city limits, a number were people from a distance who had come to our local institutions for treatment. Dividing the deaths into decades of years, we find that

There were 51 persons who died in the first 10 years.
There were 3 persons who died between the ages of 10 and 20.
There were 12 persons who died between the ages of 20 and 30.
There were 20 persons who died between the ages of 30 and 40.
There were 11 persons who died between the ages of 40 and 50.
There were 21 persons who died between the ages of 50 and 60.
There were 34 persons who died between the ages of 60 and 70.
There were 30 persons who died between the ages of 70 and 80.
There were 19 persons who died between the ages of 80 and 90.
There were 7 persons who died between the ages of 90 and 100.
There was 1 person who died between the age of 100 and 110.

In the first decade, that is 1 to 10 years, 16 of the 51 were still-born, 28 died in the first two years of life, and 7 between 2 and 10 years of age.

As usual, the greatest mortality is the infant mortality, namely, in the first two years of life. In 1911 the infant mortality was 41. In 1912 this has been reduced by 13, a reduction of 30 per cent.

The Milk Question.

In last year's report considerable stress was laid on the dissemination of disease by flies, and particular attention was drawn to the part that the fly plays in spreading intestinal infection of children, known as Summer Diarrhœa, Infantile Colic, etc. The public have in the last twelve months had ample opportunity to be enlightened on this subject, and I am inclined to believe that some portion of the drop of 30 per cent. in the infant mortality has been due to the knowledge gained on this subject by the public.

Major Merewether, assistant sanitary inspector, with his weekly articles in the press deserves considerable credit for his share in the work, but probably the rainy Summer and absence of prolonged heat was the chief cause in the reduction of this disease.

Attention was drawn to the milk depots in the City of New York and the remarkable fall in the infant mortality rate in that city as a result, and the statement was made that arrangements were being completed whereby Guelph's citizens would be able also to have the purest milk obtainable, and thus wipe out as much as possible the chief cause of infant mortality. I was disappointed with the number of applications that were made for the milk, and no doubt the wet Summer greatly lessened the demand.

Already this year the results have been published of tests made from milk supplied by the local milk dealers. These were the Babcock tests, which gave the percentage of butter-fats, the relative percentage of water, and other ingredients, which would show largely the food value of the milk, whether watered or not, but would not show whether the milk contained the germs of disease. So I am including in this report the following extracts from a report of bacterial tests of the Guelph milk supply made for me by Messrs. E. J. Wood and E. Davies of the O. A. C.—

"A fair idea of the quality of Guelph's supply may be obtained by comparison made with the standards demanded by Toronto and Rochester Boards of Health. It is estimated that between 80 and 85 per cent. of the milk received in these two cities is well above the standards set. Toronto (under Provincial Act) demands 3 per cent. butter fat, 12 per cent. total solids, and not more than half a million bacteria per cubic centimetre. According to this, Guelph compares favorably with that of Toronto, 70 per cent. of Guelph's samples being above the standard in bacteria and total solids, and 85 per cent. above the standard for fat. Rochester's standard is much higher. It insists on 3.25 per cent. fat, 12 per cent. total solids, and not over 100,000 bacteria per cubic centimetre. According to this standard only 25 per cent. of Guelph's samples are above in bacterial count, 85 per cent. in fat, and 75 per cent. in total solids—not a very favorable comparison. If Guelph adopted Toronto standards, 30 per cent. of our milk would be condemned, and 70 per cent. would be condemned by the Rochester standard." But during the year a comparison was published of the Guelph supply with that of number of Ontario towns, and Guelph was very much above the average, and compared decidedly favorably with other small cities, as well as with Toronto.

The following is the order in which the Guelph dealers stand in the report of the bacterial tests; an average of 3 samples were taken from each; some of their samples were much superior to others, and an average of all their samples is the basis of their standing in the following list:—

Barrett Dairy Company	87.65
Noble	81.25
Dawson	79.2.
Dodds	79.
Brown	77.86.
Grieves	74.06
Boreham	73.16.
Farr	69.8.
Goy	69.75.
Green	69.6.
Carter	69.
Darnell	67.46.
Whittaker	67.13.
Smith	65.35.
Stout	63.62.
Willis	61.7.
Eckstein	51.

These are based on a possible count of 100, and the markings are strictly according to the highest standard of essential elements of milk, cleanliness, and relative absence of germs.

Closure of Rendering Plant.

The Board of Health was adversely criticized for the length of time which was taken in closing the Rowland Rendering Works. I might say that the powers of the Board of Health are limited by Statute. The rendering plant was closed as quickly as it was in power to act. The complaint was made, and just as soon as it could be sworn to as a nuisance the necessary two weeks were given to the man to have it closed. The Public Health Act does not give power to the Local Medical Health Officer or to the Board of Health to abate a nuisance if in the abatement of that nuisance people are thrown out of work and it concerns the involvement of certain money expenditure, unless sanctioned as well by the Provincial Board of Health. The Provincial Board of Health sent up an inspector who confirmed the opinion of the Local Board, but the City Solicitor informed us that it was necessary for the Provincial Inspector to again inspect the place. This caused considerable delay. When the Provincial Inspector came the second time and it was in our power to close the place, the Rowland Company were given two weeks' notice and the place was permanently closed. We acted entirely under legal advice, and the place could not have been permanently closed a day sooner than it was.

Infectious Diseases.

Last year we had 14 cases of Typhoid Fever with 2 deaths. Nearly every one of these was supplied with well water, and in not one case had city water alone been used. This year there were 8 cases of Typhoid Fever, and no deaths from it, reported in Guelph. In three of these cases the disease was contracted in Ottawa, one at camp at Niagara, one at Elora, one was a recent arrival from the Northwest, and two contracted in Guelph, both of whom had used well water.

There were 63 cases of Diphtheria, and four deaths resulted.

Fifteen cases of Scarlet Fever, and one death.

There were reported to the Board 4 cases of measles, 15 of Chicken-pox, and only 2 cases of Tuberculosis were reported to the Board, but 12 death certificates were filed giving the cause of death as Tuberculosis. The new Act makes it compulsory in the future for a medical man to report Measles, Chicken-pox and Tuberculosis.

Meat Inspection.

Early in the year a deputation from Guelph and Berlin waited on the Provincial Secretary asking that the municipalities be given power to inspect the meat offered for sale within their limits, this inspection to be before and after killing. At that tme we were discouraged in our attempt, but since then Toronto and other cities have taken up the matter, and it is possible now for a municipality to have its own municipal abattoir.

Vaccination.

For years it has been compulsory that every child attending the public schools be vaccinated. The new Act leaves it at the discretion of the Board of Health and Medical Health Officer whether this be enforced or not; formerly the Boards of Education had this power.

I would recommend that the very small percentage of parents who honestly believe that vaccination for Smallpox is dangerous and of no benefit, be given the alternative —that their children be exempted from vaccination and permitted to attend school, upon the parents signing a statement to this effect, i.e. that they honestly believe that vaccination for Smallpox is dangerous and of no benefit. This privilege, however, should be subject to the same conditions as are attached in England, namely, that it shall be revoked if Smallpox be present in the City. It seems, however, to me inconceivable that anyone informed on the subject from a scientific point of view should object to the vaccination properly done in anyone physically healthy.

I would also recommend that no person suffering from Typhoid Fever be allowed to remain in that district South of the York Road and North of the River Speed between the City Limits and the Reservoir at the Waterworks, as the trunk line of our water supply comes through this district, which is rapidly becoming populated, and with a leak in that trunk line (and no doubt there are leaks in that trunk line) it would be possible for the presence of one case in that district to be a great menace to the health of the entire city. A small Pennsylvania town had its water supply infected by the excreta of a single patient and hundreds of cases resulted, and many people lost their lives. In Ottawa last year the water supply became infected from the sewage, and over a thousand cases were contracted there in a few weeks and many lives were lost. So I consider it essentially imperative that no case of typhoid fever be permitted to remain in this district.

Sewerage System.

As there is no sewerage system in St. Patrick's Ward at present this danger of infection to the city's water supply is acute. It would be almost removed were a proper sewerage system available for the citizens of that district. St. Patrick's Ward, and especially this portion referred to, should be given a sewerage system as soon as it is possible to do so.

On the minutes of our meetings will be found reference to the inability of the main sewer on Waterloo Avenue to handle the sewage of the city. Already it is too small. We recommend to the Council that this line be duplicated or enlarged, according to the opinion of the Engineer; this duplication to be from the Edinburgh Road to the sewage farm.

HAMILTON.

Dr. James Roberts, M.O.H.

Vital Statistics.

By reference to the tables it will be seen that during our statistical year, November 1st., 1911 to October 31st., 1912, there were registered 2,461 births as compared with 2,081 for 1911, representing a birth rate of 27.6 as compared with 25.4 for 1911. The ratio per 1,000 of population for the Province in the Registrar General's report for 1911 is 25.4.

The deaths for the year numbered 1,343 as against 1,162 for 1911. Excluding still births we have a mortality of 1,139 and 1,003 for 1912 and 1911, respectively, or a death rate per thousand population of 12.7 and 12.3 for those two years. By including in the total deaths those of 33 and 29 non-residents at the hospitals as will be done by the Provincial Registrar, we will have a death rate of 13.1 for 1912 and 12.6 for 1911.

In the following tables these deaths are not included as they depend upon the fact that our hospitals are favourably located for out of town patients and in no way reflect on the sanitary condition of our city.

The Registrar General's report for 1911 gives an average death rate of 17.1 for the city municipalities of Ontario.

A regrettable feature of our death statistics is disclosed in the fact that still births represent a gradual increase per thousand of population for some few years past as seen by the following figures:

For 1912	2.29	per thousand.
" 1911	1.92	"
" 1910	1.62	"
" 1909	1.52	"

The figures do not necessarily justify any sinister conclusions from a moral point of view but are largely explainable by the fact that we have a large incoming population seeking housing, homes and a livelihood under stress and strain both physical and mental, and oftentimes under circumstances altogether uncomfortable.

Communicable Diseases.

4,327 cases of Communicable disease were reported as compared with 1,122 for 1911, the numerical increase in cases being mostly attributable to the epidemics of measles, whooping cough and mumps which prevailed from December until July.

The total deaths from this group of diseases numbered 162 in 1912, 117 in 1911, 164 in 1901 and 162 in 1909, or a death rate per thousand of 1.82,—1.55,—2.25 and 2.31 for these years in the above order.

Diphtheria.

Of diphtheria 130 cases were reported, 89 in 1911 and 152 in 1910. In 1910 our percentage mortality was 15.1; in 1911 our percentage was 11.2; while this year it is 7.6.

I have already recommended to your Board the free provision of antitoxin for all cases which, if undertaken, together with securing at the city's expenses the services of a skilled laryngologist for cases deemed urgent by attending physician, would lessen the mortality percentage of diphtheria very materially.

Scarlet Fever.

Three hundred and thirty-nine cases of scarlet fever were reported for 1911. The deaths from this disease numbered 3 as compared with 8 in 1911 and the same number in 1910. Our percentage of mortalities from this disease are as follows for the past four years.

In 1909	3.65.
" 1910	3.62.
" 1911	2.42.
" 1912	.88.

Whooping Cough and Measles.

The deaths from whooping cough and measles combined numbered 38, approximately three times the number of deaths from diphtheria and scarlet fever combined. Owing to the fact that in the returns to the Division Registrar deaths due primarily to these two diseases are attributed to broncho pneumonia, the baneful results of the so-called "minor contagious diseases" particularly in early childhood, are certainly not exaggerated by the above figures.

Tuberculosis.

Caused 87 deaths as compared with 68 in 1911 and 81 in 1910. In the following table, deaths from tuberculosis are given as percentages of the total death rate for sixteen years.

1897	11.4	1905	7.7.
1898	13.5	1906	8.1.
1899	12.5	1907	7.3.
1900	13.8	1808	8.0.
1901	10.3	1909	10.0.
1902	13.0	1910	7.1.
1903	8.4	1911	5.8.
1904	9.9	1912	6.5.

It will be seen that mortality from tuberculosis averaged during the quinquennial period from 1898 — 1902, 12.6% of the total mortality; during the period from 1903 — 1907, 8.3%; and during the period from 1908 to 1912 inclusive 7.5% of the total deaths from all causes.

Typhoid Fever.

Forty-eight cases in all of typhoid fever were reported, including those reported by phone and card from the laboratory of Public Health. The epidemiological evidence in connection with these cases showed only 27 to have been infected while residing in the city, and for which therefore sanitary conditions existing in the municipality are responsible.

The deaths numbering 8 would seem to indicate a considerable number of unreported cases. That it is possible for such a conclusion to be too hastily made will be seen by a glance at our total examinations of blood for the agglutination reaction, namely 209.

A feature which tends to create a disproportion between death rate and statistical returns of typhoid fever is the reluctance on the part of some persons about sending patients to a hospital. When the focus of infection remains in the home, isolation and nursing facilities are inadequate, contact and fly infection little understood and their seriousness disregarded, with the result that where we have a virulent infection, considerable percentage of all the typhoid deaths in the municipality occur in one, two or a few families.

Smallpox.

Was imported into the city by the arrival of some negroes from a small village in North Carolina where there had been a considerable epidemic. From this source we had probably ten or a dozen cases before vaccination and quarantine enabled us to prevent any further spread of the disease. Later on a young woman on a visit from Norfolk County brought with her what was supposed to be, or had been diagnosed, chickenpox. Three or four families at least, had been infected before the department was notified and several persons having the eruption in mild form, followed their usual avocation or went about the city unrestrained. It has consequently been rather difficult to get at the contacts and to effectually stamp the disease out.

Housing.

After trying over a considerable period to arouse public protest in respect to housing conditions existing in Hamilton, we were able at a public meeting called by the Mayor to present the following report on the situation.

Permit me to preface the information in this incomplete and hastily compiled report by expressing my sincere concurrence in the belief that "nothing can so effectually destroy a city's future as the disproportionate increase of homes that are insanitary damp, dark, unventilated, unclean, unattractive and immoral." The overcrowded tenement and the slum, long tolerated as the natural concomitant of wealth and prosperity, and even regarded as the insignia of bigness and commercial activity, are gradually discovering themselves in their true significance as the preludes to civic disaster and national ruin.

Some six years ago I experienced a sense of pride in contributing to the city's publicity literature as follows: "Although the greatest manufacturing city in the Dominion, Hamilton, from a sanitary point of view, ranks as one of the most attractive residential localities in Canada.

Birmingham, Manchester and Pittsburg are associated in our minds with visions of tall chimneys, dust begrimed houses in the squalid industrial districts, and troops of neglected children.

Such a conception of the Birmingham of Canada would be an entirely erroneous one.

Our manufacturing plants are in nearly all instances, especially where recently established, models of the practical application of modern sanitary methods.

The homes of the industrial classes clustered around or near to the scene of their daily occupation, are in the main substantial and comfortable.

Our people are healthy, are mentally and physically up-to-date and progressive, are law-abiding, and imbued with the idea of keeping Hamilton in the forefront of Canadian Cities." I believe this quotation to be a fair representation of then existing conditions.

Nature has indeed smiled upon our city. In situation and environment and abundance of all natural advantages, we occupy a unique—an almost ideal position. Nevertheless, after having passed with comparative ease and safety through the dangers and diseases of infancy and childhood, we find ourselves in common with all rapidly growing American cities, face to face, at the threshold of our adult life, with the cancers and plague infections incident to the maturity of most urban communities.

No observant citizen at all in touch with actual conditions will deny that Hamilton has a housing problem.

The influx of artisans and laborers from the United States, Great Britain and other countries of Europe and the migration of workers from outside places have made the demand for additional housing accommodation steadily more urgent and pressing. The inflowing army of persons seeking employment, consisting largely of those with little or no capital and very few temporal possessions, is driven inside the city as the direct or indirect consequence of the prohibitive land values at its circumference. With what results? Every available four walls that under normal conditions of city growth would never be accused of being part of a home is eagerly seized upon and occupied, no matter how outrageous the rental.

With the object of supplying the civic authorities with some concrete and reliable data relative to conditions existent at the present time, I detailed two or three inspectors over a period of one week, to investigate as many homes as possible and to submit reports in detail points they considered relevant to our inquiry.

In all 263 familes were visited and inspections made. The 263 families, aggregating 2,200 people or between 8 and 9 per family were housed in 1,094 rooms, an average of four rooms for each family. The total monthly rental paid by these 263 families amounted altogether approximately, $3.000 per month or $36.000 per year; an average of $11.25 per month for each home of four rooms. Twenty-eight families were able to afford only one room each for living, cooking and sleeping accommodation; while two rooms answered a similar purpose for 47 of the total. One hundred and thirteen families or 43 per cent. of the entire number lived in 3 rooms or less. Fifteen families were domiciled in basements. These basements are described by the Chief Inspector in several instances as being dark, damp, cold and clammy—"more suggestive" to use his own words "of a morgue than of a dwelling house." The largest number of occupied rooms in these underground habitations was three, the rental for these in one instance being $8.75. The number of inhabitants in most cases ranged from 2 to 6 persons, the latter number comprising a man, his wife, and 3 or 4 children. In perusing the Journal of the Royal Sanitary Institute, I find the Borough Council of Woolwich to have recently obtained a conviction in a case where the front basement room proved to be dark, this being the only nuisance complained of. The room was not separately occupied or used for sleeping; it was lighted by a window looking into a small area having over it a grating through which alone light could be obtained, and it was proved that large print could not be read in the middle of the room on a clear day an hour before sunset. The Medical Officers of Health of Greenwich and Woolwich gave evidence to both of the rooms being dark and their opinion that light was essential to health. For the defence it was shown that the tenants had occupied

the room for over twenty years and were still alive. An order was made to abate the nuisance with 23 shillings costs. This, in the British Islands with its forty millions of souls and its area not more extensive than one small province of this Dominion. Nine families were housed in attics. In one of these within a couple of blocks of the City Hall, a man, his wife and four children lived. The entire space allotment for cooking, eating and sleeping, was a room 14x14 with one small window less than 2x4. It is entirely superfluous, almost an insult to common intelligence, to remark that the unhygienic environment was reflected in the countenances of the children. Sixty-seven houses showed overcrowding in a marked degree. These places are tenanted for the most part by newcomers of the industrial class of every nationality, who know absolutely nothing about the value of sunlight or fresh air—the atmosphere in some cases being so oppressive as to be unbearable. In one seven-roomed house were 45 men. In a house of eight rooms, including a basement of three rooms, were 49 persons. Of these 23 men slept in two rooms of the basement, while in the third basement room, a father, mother and four children lived, ate and slept in a room 8x10. In another nine-roomed house were 33 people, of whom ten slept in the basement. A small seven-roomed house contained 25 people, sleeping in five rooms. In other instances the number of occupants ranged from 15 to 30 in houses of 6 to 9 rooms. An attic contained 6 double and 2 single beds, where 14 men slept in an air space not exceeding 2,000 cubic feet.

In a one-roomed house 12x18, with no water closet, no privy vault and no water supply, lived man, wife and three children. One family of nine people occupied a basement in the southwestern part of the city, consisting of three rooms, for which they paid a rental of $7 per month.

In the central portion of the city one landlord has removed an old frame house to the rear of an averaged sized lot so that it abuts on an alley. Two modern brick houses have been erected at the front of the property. The old frame house, consisting of five rooms, has been rented to two families, three rooms to one for $12 per month, two rooms to the other for $10 per month. The basement is being fitted up to accommodate two families, and the owner expects to realize a total rental of $40 per month.

In practically all overcrowded premises sanitary conditions were bad; the bedding dirty, floors and walls neglected and lavatories unclean and foul smelling. Cases have come under my personal observation where beds have to be shifted with every change of weather to avoid the rain which comes pouring through the roof.

Thirty-two families were absolutely without water service and dependent on neighbors for a water supply, and while fifty houses had only the insanitary privy vault in thirty-two of these there was no provision for even waste water except in the back yard, the alley or an open drain.

Nothing but a house to house inspection, extending over several weeks and carefully undertaken, could enable us to get absolutely reliable data with reference to our housing problem. Admitting for argument's sake that we have alighted on some extreme conditions, can it be denied that while the number of homes in Hamilton is greatly on the increase, the number of unwholesome habitations is increasing faster?

Can there be much of home life, where we have the amount of multiple occupancy of small or ordinary sized houses that already exists? Where people are crowded three, four or more in sleeping apartments with insufficient light and air, can we expect other results than immodesty, a lowering of moral tone and strangulation of ideals?

Permit me to disclaim any attention of an attempt to produce unreasonable disquiet or alarm, while I, at the same time, submit that we have evidence that the germs of the slum are here, alive, making vigorous efforts at growth and that our present perils call for the attention of every earnest citizen.

The details of this report have been put forward solely as an incentive to some action being taken for the relief of the present congestion.

The discussion at this meeting, for which I have been asked to have it ready, will no doubt touch upon, in more or less detail, the different methods which have been adopted elsewhere for the relief of similar conditions and will include such phases as:

1. Municipal Housing for the Working Classes.
2. The work of what perhaps may be called "Charitable Organizations," where wealthy citizens have invested their money, not with the object of securing large interest, but of benefitng their municipality.
3. Rapid transit from the centre to the outlying districts and the decentralization of industries.
4. A proper building or housing By-law with provision for its enforcement.
5. The maintenance of houses in sanitary condition by the supervision of the Health Authorities.

The report, I am glad to say, received immediate attention. A Housing Committee composed of representatives from the Board of Trade, the City Council and various philanthropic associations in the city have been at work for several months devising plans for the relief of the present congestion, the remodelling of our building code, and for stimulating generally, interest in the welfare of our fast increasing population.

During the year about sixty houses and basements were closed on account of insanitary conditions of a serious character.

Our housing accommodation being altogether inadequate for the demand, we feel that a drastic wholesale condemnation of all premises lacking in some essential features of sanitation would be inadvisable at the present time.

Dairy Inspection.

Chas. V. Shain, D.V.S. Dairy Inspector.

With reference to dairy inspection it is the aim of the Department to have an inspector visit each dairy farm twice in the year. A score card system of inspection is used, each dairy being classed as good, fair or poor. A dairy scoring less than 40% is given time to make necessary improvements; if these are not made within the required time, license is cancelled. Dairymen are given copy of score card and told what to do and how to do it in order to make a better score.

This system of inspection creates a friendly rivalry among neighboring farmers and thus conditions over a wide area rapidly improve.

There has been of late a decided betterment in the cleaning and grooming of cows; stables are whitewashed; lighting and ventilation have received special attention.

Within the city limits many new dairies have been built having separate rooms for washing and bottling. New refrigerators have been installed and the old foul smelling, insanitary vats done away with.

The bottled milk trade is increasing and from a clean milk standpoint is much to be preferred. We have three large receiving depots where the milk is clarified, pasteurized, immediately cooled to 45 F. and kept at this temperature until delivered Two of the firms have adopted commercial pasteurization, the other uses a holding device.

The department uses a sediment test. Milk showing an excessive amount of dirt is condemned as unfit for use and prevented from being sold.

Laboratory Report.

Dr. B. F. Bowman, Director.

I have the honor to present the following report of Public Health Examinations made in the City Laboratories of Pathology and public Health for the year ending October 31st, 1912.

I was appointed City Bacteriologist and Pathologist September 1st, 1912. The report therefore covers ten months, during which Dr. Fidlar directed the laboratory and two months since I have had charge.

Last year Dr. Fidlar established nine depots in drug stores in different parts of the city where physicians can obtain typhoid, tuberculosis or diphtheria outfits. These are supplied from the city laboratory and have been a great convenience to physicians located in these different districts.

The city water has been examined daily bacteriologically, and reference to the table will show the average counts for the different months of the year.

Samples of ice from the different ice dealers in the city were examined bacteriologically to eliminate the possibility of sewage contamination.

A brief analysis of the examinations made during the year and their monthly distribution will be found in the following tables; also a comparison of the number of examinations made last year and this year.

EXAMINATION OF BLOOD FOR AGGLUTINATION REACTION OF TYPHOID FEVER.

Month.	Positive.	Suspicious.	Negative.	Total.
1911				
November	10	0	4	14.
December	5	0	15	20.
1912				
January	4	0	11	15.
February	2	2	10	14.
March	1	0	10	11.
April	4	0	15	19.
May	1	0	12	13.
June	1	0	7	8.
July	1	0	5	6.
August	7	2	16	25.
September	8	2	23	33.
October	4	3	24	31.
	48	9	152	209.

Total Examinations, 209.

EXAMINATIONS FOR DIPHTHERIA BACILLI.

Month.	For Diagnosis.			For Release,			Total.
	Pos.	Neg.	Sus.	Pos.	Neg.	Un-classified.	
1911							
November	16	42	5	47	25	0	135.
December	23	101	2	50	84	0	260.
1912							
January	38	232	17	121	105	8	521.
February	16	107	7	62	128	4	324.
March	15	198	15	6	51	10	295.
April	11	189	10	17	59	8	294.
May	26	205	19	6	60	7	323.
June	16	78	10	.....	24	.....	124.
July	7	111	3	3	45	2	171.
August	8	53	2	3	42	4	112.
September	7	47	5	14	20	4	100.
October	30	86	5	13	42	2	178.
	213.	1,449	90	253	785	49	2,839.

Total, 2,839.

DAILY EXAMINATION OF CITY WATER,

Month.	Average Bacterial count.	B. Coli present.	Chlorine.
1911			
November	17.7	——	11 to 11.5
December	5.7	——	10 " 11.5
1912			
January	7.4	——	9.5 to 10.5
February	21.8	——	10 " 10.5
March	39.3	——	10–
April	15.2	——	10 to 10.5
May	10.7	——	10.
June	24.5	——	10.
July	28	——	10.2
August	34.4	——	10.
September	39.3	——	10.
October	38.7	——	10.5

EXAMINATIONS OF SPUTA FOR TUBERCLE BACILLI.

Month.	Positive.	Negative.	Total
1911			
November	15	28	43
December	13	56	69
1912			
January	13	34	47
February	12	36	48
March	5	50	55
April	12	39	51
May	7	31	48
June	8	24	32
July	24	34	58
August	18	26	44
September	3	24	27
October	11	45	56
	141.	427.	568.

Total, 568.

LABORATORY EXAMINATIONS.

——	1910–1911	1911–1912
Diphtheria	985	2,839.
Sputum for Tubercle Bacilli	324	568.
Widal reaction	200	209.
Water examination	43	350.
Totals	1,552.	3,956.

LONDON.

DR. T. V. HUTCHINSON, M.O.H.

I submit the following brief report for the year ending November 15th. I am pleased to state that the health of the city has been very satisfactory; indeed, never better. There were only five deaths from acute infectious diseases. Exclusive of 29 still births, there were 714 deaths from all causes, of which many came from outside places to avail themselves of our hospitals, their deaths being recorded with those of the city.

For many years, up to 1910, consumption caused the largest number of deaths, occasionally as high as 60 per annum, but it has this year fallen back to third place. In 1909, 40 deaths were due to this disease; in 1910, 42; in 1911, 45. This year the deaths are only 37, which is very encouraging. Consumption is now a notifiable disease, and whenever a case is known to occur, upon removal or death the dwelling is promptly and thoroughly disinfected by the Health Department, the same as after scarlet fever or diphtheria. In addition to consumption, measles, whooping-cough, chicken-pox and mumps have also recently been made notifiable diseases.

For the last three years, pneumonia has had the largest death rate, the annual number being nearly the same. In 1910 there were 54 deaths; in 1911, 53, and this year 50.

Cancer caused the deaths of 42 persons, compared with 33 in 1911. The mortality from this disease is annually increasing, not only in this city but in the whole Province of Ontario.

Twenty-four violent deaths occurred, such as drowning, poisoning, railway accidents, etc.

There were only 6 deaths from typhoid fever, one less than last year. Twelve cases were attended at Victoria Hospital, and of the deaths, one contracted the disease in another municipality. It is very difficult to get reports of this disease, physicians waiting until a positive diagnosis can be made. The small number of deaths due to this disease shows our milk and water to be free from typhoid germs, and also that the city is in fairly good sanitary condition. Much good can be accomplished by reporting all cases, not necessarily for placarding the dwellings, but in order to prevent its spread to susceptible persons by contact, by milk, water, or the disease-carrying house-fly.

Of acute infectious diseases, I am pleased to state, we have had comparatively few cases. There were 40 cases of scarlet fever reported, with but 2 deaths. Twenty-two cases of diphtheria were reported, but of this number 8 proved to be nothing more than ordinary sore throat. Of the 16 genuine cases, there were 2 deaths.

There was one death from whooping cough. During November, printed, stamped postcards were sent to all the physicians in the city, requesting them to give the number of cases under their care upon the postcards and return them to this office. Seventy-one cases were reported. In my inspection of the public and separate schools during October and November, 51 pupils were said to be absent from school on account of whooping-cough. The disease was of a mild form and is now dying out.

Although smallpox has been in some of the neighboring towns and cities, it has not visited London for two years.

Very few children have been vaccinated during the year, partly due to the crusade made two or three years ago against vaccination, and also to the action of the School Board in annulling their regulation which required vaccination before attending the public schools.

An incinerator is at last being built for the destruction of garbage and dead animals. This has long been needed, and will be a great help in keeping the city sanitary.

A public abattoir or slaughter-house where animals could be inspected before and after killing would be a long step in the right direction. It is almost impossible to detect diseased meat after it is dressed, and inspection by a veterinary inspector both before and after killing is the only safe way. A fee of ten to twenty cents for each animal inspected would make the abattoir self-supporting, and the inspector's stamp would assure the public of the meat being free from disease.

Four loads of potatoes, one of fruit, one of pork and two of beef were condemned and ordered out of the city. It is hoped that the proposed by-law for the protection of goods exposed for sale, from the contamination of dust, flies and dogs, will pass the City Council. This by-law was recommended by the Board, and is in force in Toronto, Buffalo and other cities.

The sanitary condition of the city is improving year by year, which is proven by the small number of deaths from typhoid fever during the past three years. The invasion of a host of Polacks, Russians and Syrians into the south-east quarter of the city does not improve the sanitary condition of that district. They rent small dwellings

and into them crowd as large a number as possible, as many as twelve men being found sleeping in their working underclothes in one small bedroom. In some of these bedrooms the air space per man was as low as a hundred and twenty cubic feet, and some were even found sleeping on the ground in hen houses with the fowls. Numbers were prosecuted in the police court by the Health Department, and this may prove not only a kindness to the neighbors but to these unwashed foreigners as well.

The veterinary report upon the condition of herds and dairies supplying the city shows a marked improvement. The autumn report cannot be completed before the end of December. One hundred and forty herds have been inspected, 20 visited the second time, in which I accompanied the Veterinary Inspector. Fifteen of these were cut off until such time as they complied with the regulations of the Board of Health.

The herds supplying Victoria and St. Joseph's Hospitals were tested with tuberculin for tuberculosis. There were 60 in number, with 4 reactions. This is not a bad percentage.

The shortage of food and straw was in great measure the cause of the poor condition of many herds last spring. That improvement has taken place is evident by the fact that only two herds have been reported unfit thus far.

The Winter Cattle Fair held at the Agricultural Farm in Guelph next week should be attended by our Veterinary Inspector, as much useful information can be obtained. He is quite willing to go.

During the year I have made periodical inspections of the public and separate schools of the city. Whooping-cough has been quite prevalent for the last three months, but it has been of a mild form. Some children were found with slight skin diseases, but all got well under the care of Miss Gilchrist, the visiting nurse, whom I cannot praise too highly for the excellent work she is doing.

Taking the population of the city at the lowest estimate, 50,000, the mortality rate is a fraction over fourteen in the thousand.

S. Baker, Secretary L. B. H.

I beg to submit the Secretary's report of the Board of Health for the year 1912.

The principal matters considered by your Board during the year were that of Carling's Creek, the removal of the nuisance at Hyman's Tannery, the erection of an incinerator, making the dumps of the city as sanitary as possible, improvements to the sanitary arrangement of the Market House, preparation of a milk by-law and food by-law, and the prevention of insanitary crowding of houses by foreigners.

Your Board also made arrangements for better house connection with sewers, and the construction of a number of sanitary sewers.

Mr. James Lutman has been appointed as Sanitary Inspector, under the sole control of the Board of Health.

Your Board held fifteen meetings, and the attendance of the members was as follows: Dr. Williams 14, Dr. Burdon 14, H. Clarke 12, W. N. Manning 10, W. H. Abbott 13, R. A. Carrothers 11, and Mayor Graham 3.

I beg to submit a report for the Board of Health for the year 1912.

Carling's Creek.—This creek has received more than the usual amount of attention by this Board. Many complaints were received from ratepayers, claiming that the creek was a nuisance. It is understood that the Council of the Corporation of the City of London has under consideration a storm water system which will, it is hoped, remove all cause for complaint.

Reports.—Your Board adopted an improved form and system of reports for the use of the Medical Officer of Health and the Sanitary Inspector which, it is expected, will make the reports more serviceable.

Garbage.—Your Board conferred with No. 2 Committee on the question of a garbage system, and recommended to the Council Maitland Street as a site for the incinerator. It is understood that the Council has proceeded with the erection of the incinerator at the foot of Waterloo Street and that the structure will be completed next month.

Dumps.—Your Board caused an inspection to be made of each public dump in the city, and recommended to the Council that certain locations be set aside as a public dump in each part of the city and that supervision should be exercised by the Board of Works over them. The report of the Sanitary Inspector shows that the nuisances have been abated, and that the system is giving as fair satisfaction as is possible under the conditions.

Market House.—Your Board complained of the insanitary condition of the market house and recommended that the Council take action to remedy the defects. No. 3

Committee has made a number of changes which will, it is hoped, satisfy the demands of this Board.

Sewers.—Under the Local Improvement Act the Council requires the recommendation of the Board of Health before they have power to pass a by-law authorizing the construction of a sewer without the consent of the ratepayers. This appears to be a wise regulation. Your Board recommended that the city by-law be amended to provide that where there is a common sewer one hundred and fifty feet from the street line that the Board shall have power to compel owners to make sewer connections. The Sanitary Inspector has submitted a report showing where these connections are not yet made, and the matter is receiving the further consideration of the Board.

Sewers were ordered to be laid on Riverview Avenue, Wharncliffe Road, Elias Street, Chesley Avenue, College Avenue, and Ridout Street.

Sanitary Inspection.—Mr. James Lutman has been taken over as the Sanitary Inspector of the Board of Health and is now under the control of this Board. It has been found that, with the assistance of a few men for a comparatively short time, he has been able to supervise the backyard inspections, and his report shows that the condition of the city is very satisfactory.

Water Inspection.—Your Board has not received many reports as to the condition of the city water, but it is understood that the Water Commissioners have, from time to time, received reports from Dr. Amyot declaring the city water to be absolutely pure.

Hyman's Tannery.—For many years Hyman's Tannery has been the cause of many complaints from residents in the neighborhood. Your Board took this matter up with the Provincial Board and Mr. C. S. Hyman and, with the assistance of the City Engineer and the co-operation of the Hyman Tannery people, a satisfactory arrangement has been made, whereby the nuisance has been removed and direct connection made with the city sewers.

Milk By-law.—Your Board gave considerable attention to the revision and amendment of the city Milk By-law. The regulations for Toronto, Ottawa and Hamilton were carefully examined, and a new by-law has been adopted, on the recommendation of the Board of Health, by the City Council. This by-law is now under consideration by the Minister of Agriculture and, it is hoped, will shortly receive his approval.

Maternity Homes.—The attention of your Board has been called to the existence of a number of maternity homes in this city. The Medical Officer of Health reports them to be in a satisfactory condition.

Food By-law.—The question of the proper protection of food exposed for sale is a serious problem. Your Board, last year, recommended the Council to pass a by-law governing food exposed for sale, but their recommendation was not sustained by the Council. This year again a similar representation has been made to the Council and a by-law is now under consideration.

Crowded Houses.—The attention of the Board has been called to the fact that, in the southern portion of the city, there are a number of houses occupied by foreigners which are in a most insanitary condition. The Medical officer of Health was instructed to inspect and report on these premises, and action has been taken to close them and to prevent a recurrence of these conditions.

Officers.—I take this opportunity of thanking my colleagues for their attendance and interest in the work of the Board and to the officers for their attention and zeal in the discharge of their duties.

PETERBOROUGH.

DR. A. W. MCPHERSON, M.O.H.

I beg leave to present a report for the year 1912.

I am glad to be able to state that conditions are considerably improved over 1911. We have been fortunate in our freedom from any epidemics and particularly free from the major infectious diseases. The following report shows the number of cases reported on, with the number of deaths:

Disease.	Number Reported.	Deaths.
Scarlet Fever	32	..
Diphtheria	..	..
Smallpox	..	..
Measles	..	..
Whooping-cough	1	1
Typhoid Fever	6	1
Tuberculosis	65	26

The typhoid cases were enquired into. Three of them were from one family and gave a history of exposure to typhoid from out of town. One was from well water and two were from unknown sources. The patient who developed it from the well water died.

The number of tubercular cases is large, but this is due to the fact that the medical men are reporting in both the old and the recent infections, in accordance with the new regulations and as a result of the work of the Health Association.

In this connection I might say that we are pleased to know that the citizens are awakened to the need of taking steps to check this plague and can now boast of an active organization, with a district nurse. The aims of the Association are the same as those of the Board of Health, and therefore they should have your hearty support.

It is gratifying to note that we have had no smallpox or diphtheria and but one death from any of the major infectious diseases, tuberculosis excepted. There is a lesson to be learned from the deaths from whooping-cough and measles. These cases are not reported on as the law requires, and until they are placarded they will not be reported on and the general public will not be protected against them.

Another point that is worthy of note is the use that is being made of the Isolation Hospital. We had scarlet fever in 25 families, many of them with a number of children. In 18 of these the patient was sent to the hospital and in only two cases did a second case occur, and in these it was unavoidable. The remaining seven were kept at home. In two of these cases there was but the one child. In one case where there were two children the other was removed and kept under observation for ten days, and in three of the remaining four cases a further infection developed, making six new cases.

One of the important advances made this year was the establishment of a garbage system in the central part of the city. Considerable trouble was experienced in getting it under way, but now it is working satisfactorily. Next year we expect to have an incinerator for consumption of the garbage and hope to extend the system to the city limits.

Another step forward was the passage of a milk by-law, based on the recommendations of the Ontario Milk Commission. This provides for the licensing of the producers and vendors of milk offered for sale in the city, states under what conditions sanitary and otherwise the milk is to be produced and delivered, fixes the minimum standard of butterfat at 3 per cent., and provides for the inspection and grading of all dairies supplying milk to the city.

As this is the first year of the by-law the inspections were made with a view of familiarizing the producers with the requirements and pointing out how these may best be obtained. So far this year 28 dairies have been visited, and marks apportioned according to conditions found. Next year it is the intention to inspect all the dairies and grade them and to publish the names of all those who fail to come up to the standard. By this method we hope to get a purer supply of milk than in the past. During the year about 200 samples of milk from the milk vendors were examined for butterfat. In only a few cases did the sample test fall below 3 per cent. Where this is found, the milk vendor is notified that the test showed below standard and further samples are secured at later dates from the same vendor. To assist us in making a test for gross dirt in the milk, we are getting a milk strainer by means of which we can get an accurate idea of the cleanliness with which the milk is produced. The greatest handicap in the oversight over the milk supply is the large number of producers and vendors, the latter alone numbering over fifty.

The sanitary work proper forms a large part of our duties. This year we were able to do it more thoroughly, owing to the appointment of a Sanitary Inspector. We attempted to make a systematic examination of all premises, noting the condition of cleanliness both inside and outside the buildings, the fitness of the house as a dwelling, the facilities for disposal of sewage and kitchen refuse, the water supply, the animals kept on the premises and any other points that might have a bearing on the health of the occupants or of the people in the neighborhood. This has been done as far as time would permit and a record made in each case. With your permission, we will have a book made for this purpose and enter these details for future reference.

The conditions found in many places were far from what we desire. The wells are not cleaned out every year, the old privy pits are still in evidence, dirty stables and stable yards, pig pens, chicken coops, open manure heaps, are found all over the city. In a number of instances we had to use the police court as a last resort to compel proper conditions. The following report of the sanitary inspection will give an idea of the work done:

Inspection of houses and premises	3,865
Notices for abatement of nuisances	342
Complaints investigated	92
Manure heaps enclosed	86
Dairy farms inspected	28
Police court cases	22

In addition to this all laundries, bakeries and restaurants have been systematically inspected from time to time. The market has been visited every Saturday morning. Here conditions have been found that should be remedied, and it is our intention to draw up regulations for the market for your approval.

Since last year the Provincial Health Act has been revised. Several points are worthy of notice:

1. The number of members of the Local Board of Health has been reduced from seven to five, one of whom is the Medical Officer of Health.
2. The Isolation Hospital is placed under the control and direction of the Local Board.
3. The Medical Officer of Health is given the power to placard a house as being unfit for human habitation.
4. The duty of deciding what constitutes a nuisance is left to the Medical Officer of Health.
5. The municipality is given power to establish an abattoir wherein animals may be slaughtered under competent inspection.

Before closing I would like to make a few recommendations for your consideration:

1. That the Council be asked to pass a by-law giving the Local Board power to compel sewer connection being made where there is a sewer on the street.
2. That licenses be not issued to milk producers or vendors, to hotels, restaurants, boarding-houses or scavengers, without referring the same to the health authorities for approval.
3. That a notice of all building permits issued be given to the health authorities so that supervision may be exercised over the sanitary arrangements.
4. That a set of market regulations be drawn up, printed and posted in appropriate places.
5. That notices warning people not to spit in a public place be printed and posted, and that the police be asked to enforce the by-law.
6. That a smallpox hospital be built.

STRATFORD.

DR. J. A. ROBERTSON, M.O.H.

In presenting the annual report of the Health department of the city for the year ending October 31, 1912, I have much pleasure in congratulating you on the favorable and healthy condition of our city during the past year.

The total number of deaths from all causes was 146, and basing report as per assessor's returns of the population of the city, gives us a mortuary rate of 9.48 per thousand. This is the lowest percentage of deaths we have had for years, and one of the lowest reported in the province.

In looking over the ages at the time of death, I find that there were: Premature and still births, 25, deaths under one year 15, deaths from one year to five years 7, deaths form five to ten years, none, deaths from ten to twenty years 2, deaths from twenty to thirty years 13, deaths from thirty to forty years 9, deaths from forty to fifty years 10, deaths from fifty to sixty years 13, deaths from sixty to seventy years 18, deaths form seventy to eighty years, 18, deaths from eighty to ninety years 15, deaths from ninety to one hundred years 1. In all 146.

Deducting the premature and still births from our death rate, the percentage per thousand would be considerably less.

CONTAGIOUS DISEASE.

I am pleased to report that the number of contagious diseases was a decided decrease over previous years.

Diphtheria—During the past year there were reported in all 12 cases with no deaths; nine of these cases were treated in the diphtheria hospital with good and satisfactory results.

Scarlet Fever—There were in all 15 cases reported with one death, a decrease of five over the previous year.

Typhoid Fever—There were 15 cases with two deaths, a decrease from last year, there being 41 cases reported with three deaths during that time.

Consumption—Again seems to be about the head of the list, there being 15 deaths from that cause. It is to be hoped that the experiments which Dr. Alexis Carol, a member of the staff of the Rockefeller Institute of Medical research, which is now demonstrating to the world as a curative of that much dreaded disease, may prove successful. I wish to state that all cases of tuberculosis where diagnosed as such, must be reported at once by the physician in attendanec to the Medical Health Officer, not for isolation, but for the same to be reported to the secretary of the Provincial Board of Health.

Milk Supply Satisfactory.

Milk Supply—Our milk supply is on the whole satisfactory. Inspections of the premises of the vendors have been made and I am pleased to state that attempts have been made to comply with the recent Provincial Act, yet there are many conditions which might be improved. In future a score card will be submitted to each vendor basing his conditions of supply on the character of the herd as to considered freedom from tuberculosis, the cleanliness of the byres, the purity of the water supply for drinking and for washing of utensils used for milking, the keeping of the proper temperature as per Government requirements as per By-law enacted, when delivered to the consumer. The technique of the milkers, as to cleanlization of the udders and personal dressing, while the milking will receive the proper attention. A certain percentage will be given for the above requirements during the year and only those who will receive the minimum of 75 per cent. will receive certificates.

I would like to add a few words of advice to our citizens relative to the milk supply. The milkman from our experience is not always to blame. The householders are not always careful in the handling of milk. They do not on the reception from the vendor, place it in a refrigerator, ice-box or cellar and keep it at a temperature not exceeding 50 degrees. They often leave it in the kitchen uncovered and exposed to flies; often it is openly exposed in a room where people are ill; frequently the pitcher is never washed from the time of reception until the receiving of the milk again and the milkman is blamed for causing gastric and intestinal trouble to the young babe. Householders should consider this matter carefully and act accordingly.

Scavenging—For years I have been urging upon the Council the necessity of having some system of garbage collection and disposal carried out. Two years ago the ratepayers were promised by the Council to have this matter considered and completed, but as yet no report has been forthcoming from the committee who had this matter in charge. Our City has got to that size when such is absolutely necessary for the protection of the health of the citizens, and the ratepayers are getting tired of the dilly-dallying regarding this matter. By-laws of minor importance seem to receive consideration and support. Let some "Cromwell' arise and press this important and necessary requirement and put life into "dead bones" and his municipal success will be assured. The public are waiting results. The health of the citizens is paramount to convenience.

Slaughter Houses—These are in as good a condition as can be expected under the circumstances, although there is great room for improvement. In them there seems to be no system of drainage and a woeful want of necessary equipment. I have for years been advocating the establishment of a public abattoir with cold storage where all animals would be inspected before being slaughtered and carcasses inspected by a competent inspector appointed by the Government. Last year the Council appointed a committee to investigate, report and act regarding this matter yet nothing has been forthcoming. The City of Berlin is dealing with this matter in a prompt and handsome manner and a lesson to our incoming council should be taken therefrom.

Livery Stables--The Board of Health has framed regulations based upon the City by-law relating to such. Stable manure has undoubtedly been proven to be the breeding place of stable and other flies. The stable fly is, and has been proven to be the carrier and source of infantile paralysis as well as other diseases. Your Board, by resolution passed, is determined to have all stable manure during the coming spring kept in properly covered bins and the windows of the stables, as well as the doors leading into the place where the horses are to be kept, protected by proper screens.

City Water—Our city water as per analysis continues to be free from coli bacilli of typhoid contamination although at times from its insanitary appearance, doubts of its purity present themselves. The commissioners should be alert in their endeavors to avoid such fears.

The recent act respecting the public health—in view of the fact that the sanitary investigation is enlarged from that heretofore, and that it requires a man of practical experience, thoroughly trained in all details of sanitary work, including quarantine,

isolation and disinfection and to thoroughly understand what to do to have proper sanitation of our lanes, cellars, drains, plumbing, restaurants, laundries, lavatories, public streets, food and milk supply, school houses, hotels, and everything pertaining to the public health; to do this would require his almost combined attention for 8 or 10 hours a day. A thoroughly trained and experienced man, such as our present inspector, should receive the remuneration of at least $1000 a year. The risk of danger to himself and family is such that few would care to undertake and our city has now grown to that size that it should satisfactorily remunerate such an officer.

Plumbing—This in future should receive careful attention. The revenue demanded for work done should demand careful and sanitary conditions.

Rabies—Epidemics of this much dreaded disease seem to prevail in different parts of the province. The by-law relating to the quarantine in the city seems to a great extent a dead letter, as dogs are daily seen to be running at large, unprotected and unhurt. Our Chief of Police deserves credit for his active carrying out of the provision of the by-law under adverse conditions.

Food Exposure—Your Board had under consideration the desirability of having a by-law introduced whereby fruits and vegetables exposed for sale should be kept under properly covered receptacles so as to prevent contamination from dust, which is rich in bacteria or other insanitary source dangerous to the consumer, but no decided action was taken thereon. The public desire action as to the carrying out of what they consider a much needed reform. I would strongly impress upon the Board the necessity of urging upon the incoming Council the desirability of carefully considering your suggestions and recommendations relative to the measure presented to you which in your opinion was necessary for the protection of the health of the citizen.

Year after year the report was merely read and passed over without any comment or action thereon. Yours is the most important committee of the Council and apparently receives the least consideration. Any member of the council who may be bold enough to take a firm stand re matters pertaining to the public health, will receive the hearty support of all right thinking ratepayers.

JAMES TROW, CHAIRMAN L.B.H.

This board has held nine meetings during the year and I may say that at every meeting the members did the work allotted to them in a business-like and very harmonious way. During the year the junk and pit by-laws were passed, and, as regards the junk dealers, they will all have to move further out from their present locations or stop doing business 1st July next, and according to the Provincial health act all hotels and livery stables are to procure covered bins or boxes in which to place their manure, and we trust that these different parties will live up to the law on or before the 15th day of May next.

I may state here as chairman of the Board, that we cannot too valuably appreciate the services of our Relief Officer and Sanitary Inspector, Mr. Dunseith, for his untiring energy and closeness to his work, as in my mind always on the job, and his salary should be raised during the coming year.

Trusting that all the members who may be fortunate enough to be appointed on said board for the coming year will feel their responsibility and attend regularly at each and every meeting called, as I look upon the Board to be one of the most responsible and highest, when we look after the city's health in general.

THOS. DUNSEITH, SANITARY INSPECTOR.

In presenting my Annual report I am pleased to be able to state that we have had a very favorable year; the number of cases of contagious diseases being very much less than previous years.

I used every precaution where communicable disease existed, and was extremely careful in cases of Tuberculosis, burning clothing and bedding and having wall paper removed, etc.

The total number of houses, schools and factories disinfected was 113.

As to the sanitary condition of the City there is still room for improvement, owing to our very unsatisfactory methods of garbage removal and disposal. The dumping ground for garbage is very inconvenient, it being so far out, and the road to it almost impassable during the Fall, Winter and Spring months. The garbage wagons are often stuck in the mud and the whole or part of their insanitary loads left on the road which again causes trouble in its removal. We have a competent man caring for the dump. I visit it many times during the year and find his work satisfactory.

I inspected the slaughter houses several times during the year and found their condition fairly improved.

I also frequently inspected the Livery Stables of the City and notified the proprietors as to the By-law recently passed by the City Council. They have not all fully complied with the requirements of the By-law, but promise to make the necessary improvements and erect manure bins with covers.

The owners of outside W. C.'s. in Fire Limit "A" have been notified to make necessary changes to conform with the By-law. Quite a number have made the changes. Others because of unsuitable buildings and limited means have not complied, and I have not steam rollered them but we expect all within Fire limits "A" and "B" to have all outside closets abolished before July 1st, 1913.

I also frequently inspected groceries, bake shops, confectioneries and restaurants and found in the hot weather that many of them were terribly infested with flies. This nuisance could be greatly reduced by more general use of screens in doors and windows and by keeping all food covered from flies and dust. I also inspected Hotel dining rooms and kitchens, and found them all in good sanitary condition and well protected by screens.

I inspected the dairies and found them greatly improved as to sanitary conditions. I granted licenses to 22 of them, giving them the privilege of selling milk in the City. I tested the milk as to butter-fat, solids and water, and found it all up to the standard of the Ontario Act.

Every Saurday I made inspections of meat, butter and other food products brought on to our Market for sale and sometimes found *Inspection* necessary.

Every day I have inspections to make as to sanitary conditions in some part of the City, alleys, lanes, backyards, streets, etc., I must say conditions are improving as people are becoming more alive to the fact that the health of themselves and their neighbors depends largely on the care they take of their premises, and the proper disposal of all refuse.

I made inspections of the dairies and slaughter houses under the supervision of the Medical Health Officer. We were also in some cases courteously accompanied by the Chairman and other members of the Board of Health. We were indebted to the Medical Officer of Health and the Chairman for the use of their cars on these inspections. I was also accompanied on many of my inspections in the City by the Medical Officer of Health.

ST. CATHARINES.

Dr. F. King, M.O.H.

I beg leave herewith to submit this my report for the year ending Nov. 15th, 1912.

The city has been very fortunate in regard to contagious diseases, there being all told only 45 cases reported, of which 6 resulted fatally. The cases reported were as follows:

Typhoid Fever, 5 cases, and all were from outside the city, having been brought to the hospital; three of these cases resulted in death.

Diphtheria, 5 cases, all recovered.

Scarlet Fever, 19 cases, resulting in two deaths.

Whooping-cough and Measles, 5 cases, all recovered.

Infantile Paralysis, 1 case, with fatal results.

During the year there were 339 births registered, being 50 more than in 1911. Marriages registered, 152, being 4 less than in 1911. Deaths registered, 234, being 22 more than in 1911.

A very large amount of sewers were laid, as follows: 1,000 feet 6-inch, 700 feet 8-inch, 17,480 feet 10-inch, 5,800 feet 12-inch, 890 feet 15-inch, and 58 feet 24-inch; also a trunk sewer in the eastern section, 3,400 feet of 24-inch and 6,850 feet of 20-inch, and also 276 sewer connections were made.

Mr. F. Howse, our late Sanitary Inspector, placarded and fumigated all houses where contagious diseases existed, and attended to his various duties as his health permitted, and our newly appointed Inspector is now fulfilling the duties in a satisfactory manner.

The Isolation Hospital has been a very useful place, and further rooms should be made to make it up to what it should be, as the growth of the city will likely require it oftener in the future than in the past.

All of which is respectfully submitted.

Jas. A. MacMahon, Chairman Board of Health.

In accordance with Paragraph 3, Schedule B, Section 122, Public Health Act of Ontario, I have the honor to submit my annual report.

Contagious and infectious diseases, 45 cases reported, of which six died. Five of these cases were typhoid, brought to hospital from outside points.

Births, 50 more than in 1911. Total, 339.

Deaths, 22 more than in 1911. Total, 234.

I believe the health and sanitary conditions of this city are equal to any in Ontario.

WINDSOR.

S. Lusted, Secretary Local Board of Health.

As you are doubtless aware, the new Public Health Act (Chapter 58, 2nd George V.), is now operative, and under its provisions Local Boards are materially changed. In cities the Mayor and Medical Officer of Health are ex-officio members, and three ratepayers appointed by the Council at its first meeting annually make up the number that constitutes the Board. Thus the Corporation is practically renewed every year, instead of in sections covering three years as formerly. Another change in the law that affects all municipalities provides for the appointment of District Officers of Health, whose duties partake somewhat of the nature of inspector of Local Boards, clothed with large powers, under the Provincial Board. The incumbent of the office for the district embracing Windsor, Dr. Bentley, has already made several visits to this city, and his activities will in all probability lead up to the improvement of health conditions in this and other portions of the westerly section of the Province that are placed under his supervision.

The work done by the Local Board during the past year has not been characterized by any new features, but has largely been of the "usual round and common task." The excitement that formerly seized the public mind upon the appearance of smallpox in our midst has practically ceased; the people by experience having come to regard the Board's constant preparedness, and the isolation hospital treatment of patients so generally effective, as to remove all ground for apprehension either on the part of the afflicted or the protection of the public from contagion. The number of cases of communicable diseases occurring in the city in the past year, so far as reports to this office afford evidence, is much below the figures of the preceding year. Scarlet fever was reduced from 38 to 26 cases, and diphtheria from 23 to 11, with none fatal. Typhoid, according to public opinion, has prevailed largely over the city, but only *one case was reported*, although *eight certificates of death* from that disease have been brought in and burial permits issued. Why reports are not made as in cases of the other diseases mentioned is beyond our ken, and it is understood Dr. Bentley is giving that matter his especial attention. The cause of this exceptionally dangerous disease is still open to question and is pretty hotly disputed. The water supply is easily blamed, sewage contamination being freely asserted and possibly justified; but other sources are not by any means free from suspicion. In the judgment of many, the milk sold for consumption, far more than the water, introduces the germs of the malady into the human system; and some better statutory provision than any yet made for controlling and ensuring the purity of the milk supply is anxiously awaited. Under the direction of the Chief Officer of Health, Windsor's water is now treated chemically before being pumped through the supply pipes; and the current year will therefore demonstrate beyond question whether or not the water or the milk we use ought to be charged with disseminating the cruel disease.

Garbage collection and cleaning of alleys under the direction of the Public Works Department has been well attended to; but as usual considerable difficulty in the satisfactory discharge of the service is still experienced from the lack of co-operation on the part of householders and property owners. Only when the public realize that the sanitary condition of the alleys is not only a public concern, but a matter of personal, individual interest—when the occupant of a dwelling or store shall come to realize that a littered and pest-breeding alley is more objectionable and dangerous than a dirty pavement—need a thoroughly sanitary condition of these by-ways be hoped for.

An extraordinary state of activity marked the year just past, alike in building construction and the making of pavements and sewers. Windsor has practically abandoned the notion that the city is designed only for a residential suburb of Detroit, and has effectually hung up its shingle as a manufacturing centre, with the result that factories are fairly looming up in nearly every ward, but especially in the second and third. This accession to the wealth and population of the place has involved remarkable activity on the part of the City Council as a whole, and the Public Works Committee particularly; and new pavements and sewers in unequalled number and extent, form the distinguishing feature of the year's history. This rush of progress reflects itself upon every branch of the city's service, not excepting the Board of

Health, the work devolving upon the latter growing the more important and expanding proportionately with the general advancement.

A matter that has been latterly forced upon public notice by an indictment in the County Court, and by an order issued by Dr. Bentley, should have further attention by this Board, namely, the police offices and cells in the City Hall. The health of court officials, as well as of the unfortunates who are committed to the cells, deserves consideration; and you will find in the several plans of amelioration of admittedly bad conditions something the attentive contemplation of which will naturally occupy your minds until a settlement of the question is reached.

CAUSES OF DEATHS.

Arterio-sclerosis	30	Injuries	2
Appendicitis	3	Ilecolitis	5
Apoplexy	3	Insanity	1
Angioma	1	Influenza	1
Accidental	8	Lack of Respiratory Act	1
Accidental Drowning	1	Lues	1
Acute Indigestion	2	La Grippe	1
Anaemia	1	Meningitis	8
Alcoholism	1	Mitral Regurgitation	1
Bronchitis	5	Malignant Disease of Pancreas	1
Biliary Colic	1	Marasmus	4
Blood Poisoning	1	Malnutrition	6
Broncho-pneumonia	2	Myocarditis	4
Cerebral Apoplexy	2	Mycosis Fungoides	1
Carcinomatous fibro myoma	2	Natural Decline	1
Cerebral Hemorrhage	4	Natural Causes	2
Contusion at difficult birth	2	Nephritis	4
Concussion of Brain	2	Nonclosure of Foramen Ovale	1
Cardiac Dropsy	3	Obstruction of Bowel	1
Cancer	10	Old Age	2
Cardiac Disease	1	Pneumonia	23
Cystitis	1	Pernicious Anaemia	5
Cholecystitis	1	Premature Birth	11
Cholera Infantum	5	Pernicious Vomiting	1
Chickenpox	1	Peritonitis	2
Childbirth	1	Pyorrhoea Alveolaris	1
Carcinoma	8	Papilloma of Bladder	1
Difficult Birth	1	Puerperal Septicemia	1
Diabetes	3	Phthisis	3
Dysentery	1	Rheumatic Endocarditis	1
Disseminated Sclerosis	1	Rheumatic Fever	1
Degenerated Heart Muscles	1	Rheumatism	1
Enteritis	3	Respiratory and Heart Failure	1
Empyema of Gall Bladder	1	Rheumatic Heart	1
Erysipelas	1	Suppression of Urine	1
Entero Colitis	1	Still-born	14
Ectopic Gestation	1	Senility	2
Epilepsy	1	Senile Atrophy of Brain	1
Embolism	1	Sclerosis of Spinal Cord	1
Fracture of Hip	1	Suffocation Before Birth	1
Fell Dead	1	Senile Decay	5
Fracture of Skull	1	Septicemia	1
Fracture of Cervical Vertebra	1	Suicide	1
General Paresis	1	Spinal Meningitis	1
Gangrene of Feet	1	Tetanus	2
Gunshot Wound	1	Tubercular Adenitis	1
Hemorrhage of Brain	2	Tuberculosis	8
Heart Disease	15	Typhoid Fever	12
Hemorrhagic Monatorum	1	Tumor of Throat	1
Hemophilia	1	Tubercle of Kidneys	1
Hernia of Brain	1	Tubercular Enteritis	1
Heat Apoplexy	1	Uremia	1
Hypertrophy of Prostate	1	Weakness	1
Intestinal Obstruction	3	Whooping-cough	1

WOODSTOCK.

DR. F. S. RUTTAN, M.O.H.

I submit herewith my annual report for the year ending November 15th, 1912.

The number of deaths, exclusive of still-births, for the year was 132, an increase of 9 over the number for 1911, which gives the mortality rate per thousand population of 13.12.

Deaths occurring between the following ages:

	Male.	Female.
Still born	7	5
Premature	3	1
Under 1 week	2	2
From 1 to 5 years	6	5
From 5 to 10 "	3	4
From 10 to 20 "	0	1
From 20 to 30 "	4	2
From 30 to 40 "	7	3
From 40 to 50 "	4	2
From 50 to 60 "	3	8
From 60 to 70 "	8	4
From 70 to 80 "	9	9
From 80 to 90 "	19	12
Frym 90 to 100 "	4	3
	0	3
Total	78	66

From a statistical point of view, it is of interest to note that of eleven deaths among children occurring under one year of age, 81.9 per cent. were artificially fed.

REPORTABLE DISEASES FOR 1912.

Disease.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Total.
Diphtheria	2	....	....	....	....	....	1	....	....	....	....	....	3
Measles	1	....	....	....	....	2	....	1	1	....	....	....	5
Scarlet Fever	....	....	....	....	....	....	....	....	....	....	1	2	3
Typhoid	3	....	1	....	....	....	....	3	1	4	....	....	12
Smallpox	....	....	....	....	....	8	1	....	....	....	....	1	10
Totals	6	....	1	....	....	10	2	4	2	4	1	3	33

The city has been particularly free of infectious and contagious disease, only 33 cases being reported.

Twelve cases of typhoid fever were reported, of which number of cases seven were from outlying districts. Some of the remaining cases were probably contracted elsewhere than Woodstock.

We have again had our complement of smallpox, and local epidemics will continue to occur so long as vaccination laws are not enforced by provincial authorities.

I congratulate the Board of Health on the interest taken in sanitation.

During the year your Board have drafted the milk by-law to comply with the Provincial Board of Health; have secured a by-law to regulate the delivery and exposure for sale of meat, poultry, game, flesh, fish and fruit; have secured a by-law to abolish outside closets within certain limits, and also succeeded in having the council to assume control, drain and pave two rear lanes.

I have urged upon your Board the necessity of having some system of garbage collection and disposal adopted. At present we are in need of suitable grounds for garbage disposal. I would heartily endorse municipal collection of garbage and disposal of it by incineration.

At an early date the Council will be requested to assume control, drain and pave two other rear lanes which are much in need of attention.

At an early date plumbing by-laws will be submitted for your approval.

Milk Supply.—Dairies were inspected twice during the year by our veterinary inspector and improvements ordered where considered necessary.

We are in need of an isolation hospital for the reception of infectious and contagious diseases other than smallpox.

I would again remind you to take into consideration the desirability of having a public abattoir.

Nine deaths from phthisis should be a sufficient reminder of the necessity of taking some definite action in regard to a tuberculosis sanatorium that patients could be placed under the best possible hygienic conditions.

The city should take the initiative in sanitary reforms, and their opportunities are many.

Sanitary drinking fountains should replace the disease-carrying public drinking cups.

Our lock-up is a disgrace to civilization.

The work of removing privy closets has not proceeded as rapidly as expected; in many cases the contracts are placed, but there is evidently a deficiency of plumbers. I would again recommend the abolishing of all privy closets where sewers are convenient.

In conclusion, I wish to thank the Board for the interest shown during the year, and I regret to record the death of our esteemed chairman, who was a most progressive, energetic and efficient official.

BARRIE.

Dr. A. T. Little, M.O.H.

Contagious diseases reported were as follows:

Scarlet Fever.—In November, 1911, 1 case; in December, 1911, 5 cases; in January, 1912, 6 cases; in February, 1912, 5 cases; in March, 1912, 3 cases; in April, 1912, 4 cases; in May, 1912, 3 cases; in June, 1912, 5 cases. No cases reported since June, 1912. Deaths from scarlet fever, none.

Typhoid Fever.—A complete list cannot be given, as cases are not reported fully. Many of these cases are treated in our hospital. The records of the Royal Victoria Hospital show as follows: For the year 1910, 50 patients treated; in 1911, 26 patients, and for the year 1912, 9 cases. Most of these were out-of-town patients. Deaths from typhoid fever, 2 cases.

Whooping-cough.—No cases reported. Registration shows 2 deaths.

Cerebro-spinal Fever.—Three cases were treated in the Royal Victoria Hospital. Two came from an adjoining municipality. All three were fatal.

Tuberculosis.—Cases not reported. Registration shows 6 deaths.

A great advance has been made from a sanitary point of view by the abolition of the privy pits and in their places the installing of the dry earth system of closets. By this change the danger of contamination of the wells in the outlying districts will be greatly reduced.

The town has to be congratulated upon its work of sewer extension during the year. A great deal of this work was executed upon sanitary grounds and on the recommendation of the Board of Health. In all 79 sewer connections were made. Twenty-seven cesspools were closed in and no new ones were allowed to be constructed. Four permits were granted for the inception of septic tanks.

A census taken by the Sanitary Inspector shows over 1,500 houses. Outside closets in 788, about 50 cesspools. The remaining houses have sewer connections.

Our Sanitary Inspector, Mr. G. Hagart, has been most energetic in his endeavors to give us a clean town, but until we have a proper municipal service for the removal of garbage and other refuse matter we cannot look for great results. The individual cannot be depended on to do this work. Our annual spring cleaning is not sufficient and the deplorable method of dumping the year's accumulation of dirt on the streets, there to await, for days and even weeks, its removal by the town teams, cannot be condemned too strongly.

A weekly collection of such matter would involve only a small additional expense to our people and would give us a clean town throughout the year.

In bringing my report to a close I have to thank the Chairman and the Board for the great assistance they have given me in trying to promote the best interests of the town in sanitary matters. Our inspector has assumed the full responsibility of his office and has done his work in a most satisfactory manner.

GALT.

Dr. T. W. Vardon, M.O.H.

In making my annual report for the year ending November 1st, 1912, am pleased to say that during that time the health and sanitary condition of the town have been satisfactory. In the beginning of the year we had a few cases of scarlet fever and diphtheria together, with only six cases of typhoid fever. The origin of nearly all these cases has been traced to outside causes. You will see by the attached report of the Division Registrar that there have been 160 deaths and 223 births. Seventy-seven of those who died were over fifty years of age, of this number two were over ninety years, eighteen between eighty and ninety, nineteen between seventy and eighty, fourteen between sixty and seventy, and the remaining between fifty and sixty. The number of children who died in their first year was 24. Deducting the number of still-born and those who died in the hospital from outside places, from the total number of deaths, makes the death rate a little over thirteen per thousand of our population, while the birth rate is twenty-three. This I think is a good showing, as over one-half of all those who died were over the half-century mark.

The collection and disposal of garbage is a vexed question in all towns and cities. The present Council has already adopted the principle of placing in next year's estimates the sum of $2,500 to carry on this work, and there can be no doubt but a proper system will be installed and operated in the near future. The ideal system, that of installing and operating an incinerator plant, is too expensive for places the size of Galt. In the meantime we will have to be content to secure proper places for the disposal of the garbage which will not be a nuisance to anyone.

The Swiss Cottage has been opened on four different occasions, viz., for the treatment of the following diseases—twice for scarlet fever, once for diphtheria, and once for smallpox. In this connection I would recommend that the present building be divided by a solid partition, the one side to be used for the treatment of scarlet fever and the other for the treatment of diphtheria patients, that the outbuilding be moved to the bottom of the hill and used for smallpox patients, also that a tight board fence be built around the latter. If this is carried out it will provide hospital treatment for all these infectious diseases at a small cost.

I would again recommend the Council to pass a by-law closing all outside closets and cesspools on lines of sewers, giving those who live on those streets a reasonable time to connect therewith.

As you are aware, important amendments were made to the Health Act at the last session of the Provincial Legislature, giving the Boards of Health greater powers than before, also reducing the number of members on the Board. In towns of our size the Board will consist of three members appointed by the Council, the Mayor and the Medical Health Officer.

A money value cannot be placed on human life. Who could calculate the value to the world of such men as a Dr. Jenner, who discovered vaccination for smallpox, or of Harvey, who discovered the circulation of the blood, or of Lord Lister, who brought into use aseptic surgery, or such men as Pasteur or Koch, who brought into use the antitoxines which have proved so valuable in the treatment of diphtheria, hydrophobia, tuberculosis and many other diseases, or of the great electric wizards—Edison, Marconi or a Bell. From the humblest walks of life statesmen, poets, inventors, philosophers and rulers of the people have sprung—Burns followed the plough, Lincoln split rails, and the late General Booth rose from the ranks. The lines that medical scientists and others are working along to-day are for advanced methods of hygiene and preventive medicine. So far wonderful results have been obtained from the same; without their aid the Panama Canal could not have been built. The treatment of disease is a secondary consideration—"prevention is better than a cure." The laws governing health and protecting people against disease should be made so perfect that the existence of a nuisance should be made a criminal offence against those who are responsible for it. The Councils and Health Boards are under obligation to the people to supply pure water, to provide proper methods for the disposal of sewage and garbage, also to see that the people are properly housed and that the occupants are compelled where necessary to keep them clean. That all public buildings, such as colleges, schools, churches and municipal buildings be erected on sanitary lines so as to provide plenty of light, pure air and other necessary arrangements that are essential to health. It is said that 55,000,000 children are born in the world every year; 15,000,000 of these die before reaching the age of one year. I think I would be safe in saying that twenty-five per cent .of the remainder are either mentally or physically defective. What are we to do to help this vast army of children? First, it is the duty of the State to see that they are properly cared for. This can only be done by instituting proper and efficient inspection of these children, both at home and in the schools. I

believe the medical inspection of children in all schools should be made compulsory, and I would advise our school boards to adopt the same as soon as possible. The school boards can be of great benefit to the children by establishing forest or out-of-door schools. This has been worked out both in England and Germany, and the schools have proved a great boon and benefit to the children. Toronto and Hamilton have had them in operation during the past summer months and are well satisfied with the results. I would recommend the school board of Galt to establish a forest school for delicate scholars; it can be carried on in one of our parks with but little expense. You may give a child a good education, but if it is physically defective it may be compared to a motor car that has a full supply of gasoline, but whose machinery is out of repair. In this vigorous, hustling world not only is a good education necessary but a strong, healthy body. There never was a time when more was required of the individual than to-day, hence the necessity that our children should have a healthy body and a vigorous mind. It may to many seem premature and that the time has not yet arrived, but with all due deference to those who may think otherwise I believe that laws regulating marriage should be made that all those who are about to enter into marriage ties, before being granted a license, should present a certificate, granted by a proper board of qualified examiners, that they are physically and mentally sound. That the expense of this examination should be borne by the State.

We are now feeling the effects of the high cost of living. All animal foods, such as meats, poultry, fish, eggs, milk, cheese, and butter have increased in price during the last few years from one to two hundred per cent. We would be just as healthy if we ate much less animal food and instead used more cereals, fruits and vegetables. If for one year we, the people in general, would only eat one-quarter of the animal foods we are now using, we would bring the meat barons to time and in the meantime our health would not suffer; on the contrary, in many cases we would be healthier for it.

The appointment of a Sanitary Inspector is a necessity and is compulsory under the new Health Act. This town now requires an inspector to give his full time to sanitary work.

INGERSOLL.

Dr. J. A. Neff, M.O.H.

I beg to submit my report for the year ending November 15th, 1912.

I am pleased to be able to report that the whole year has been very healthy, and that our citizens have escaped epidemics of all kinds, there having been but five cases of communicable diseases reported, viz., four of scarlet fever and one of diphtheria.

There have been ninety-four births and eighty-three deaths reported by the physicians and registered by the town clerk, showing an increase of eleven in population from natural causes during the year. Only five of these deaths were caused by communicable diseases, viz., four by tuberculosis and one by typhoid fever.

I am strongly of the opinion that all cases of communicable diseases of the town have not been reported to the Medical Department.

I trust that all the local physicians will report their cases so that the citizens of the town may be protected from the spread of such diseases according to the Medical Health Act.

At the annual tour of inspection of the Board of Health nearly all the dairies, slaughter-houses and other places visited were found satisfactory, many of them being in splendid condition. Two of the dairies were not up to the requirements. Both these, however, were undergoing repairs, and when completed will meet with the approval of the Board.

The schools are all clean and better kept than they were in past years. The defects in ventilation and lighting in the Central School are still with us. The Board of Education, however, has these under their serious consideration at the present time and will no doubt deal with them. Am pleased to report that the fire escapes of this school have been greatly improved and are now satisfactory.

The ventilation and heating of the Ward School are also receiving the consideration of the Board of Education, and I am hopeful that they will be made adequate and satisfactory. The sanitation of the Collegiate Institute has been greatly improved by the removal of the janitor's family from the basement of that building.

The failure of the by-law to supply a sewerage system for the town is to be deplored. I trust that a system more in accord with the present needs of the town will soon be considered, and that when it is it will receive the support of the citizens at the polls.

I am still of the opinion that the herds furnishing the milk supplied the town should be inspected by a competent veterinary surgeon at least three times a year and that all tubercular animals found should be slaughtered.

ORANGEVILLE.

Dr. T. A. Carson, M.O.H.

During the year 1912 Orangeville has been very free from epidemics or any disease of a communicable nature. During the months of January, February, March and April, whooping-cough was very prevalent; none of the patients were seriously ill and no deaths occurred. As the present Health Act was not in force then, no isolation or quarantine measures were adopted.

We also had several cases of diphtheria about the same time. Those afflicted were living in various parts of the town and no connection could be traced in any case. Rigid quarantine was enforced, every precaution taken with thorough disinfection after recovery and no difficulty was found in stamping out the disease. In this respect we found the Provincial Laboratory of much benefit both in diagnosis and in the examination of release swabs. We had one death.

Only two cases of tuberculosis were reported. Both patients have been supplied with literature, and I believe every precaution has been taken to prevent infection. No cases of typhoid fever, meningitis, or scarlet fever were reported.

For the reporting of communicable diseases, I had the proper cards printed and distributed to the different physicians, and believe in future we will be able to keep track of such diseases in a more thorough and convenient manner.

During the year there have been many complaints regarding the existence of nuisances in different parts of the town. These are nearly all traceable to the fact that the town has no proper method of sewage disposal. A large majority of the so-called "septic-tanks" have the overflow discharging into surface drains, old wells and also merely on the surface of the ground. In many instances closets empty direct into surface drains. Some definite steps must be taken by the municipality in the very near future to establish a sewage system, and I would recommend the Board arrange a meeting with the municipal council to talk the matter over and endeavor to, at least, commence the installation of a system of sewage disposal, which might be added to from time to time, or to have a complete system arranged for as early as possible.

The opening of Lord Dufferin Hospital is a matter of congratulation to the town, and will aid very materially in the care of those requiring hospital treatment and attention.

With Public School Inspector Liddy, I examined the Orangeville Public School very thoroughly and found it in very good condition. The School Board have rearranged the closets, and with the close attention now given them should be in splendid condition. The ventilation in most of the rooms is good, but requires a good deal of attention, as the heating system is not the best for such an institution.

In September I attended the meeting of the Canadian Public Health Association held in Toronto. This phase of educating the different medical health officers and bringing to their attention the various methods of combating disease, sewage disposal and other matters pertaining to the health of the Province, seems to me an excellent one.

In conclusion, I must admit that many of the enactments of the new Provincial Health Act are not properly enforced, but as the different provisions are better understood, the duties of the Medical Health Officer and the Board better defined, and as the position of Medical Health Officer is now permanent, I feel assured no complaint will be found another year.

The following is a report of the health of the town for the year:

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	0	0	0	0	0	0	2	0	0	0	0	0	2
Diphtheria	1	3	2	2	0	0	0	0	0	0	0	0	8
*Whooping Cough .													
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0

* None reported. Prevalent in Jan., Feb. and Mar.

SARNIA.

DR. A. C. POUSSETTE, M.O.H.

In accordance with instructions contained in Public Health Act, I beg to report as follows:—

I am glad to be able to report that during the past year, 1912, there has been nothing that can be considered an epidemic of an infectious disease in the Town of Sarnia.

The typhoid fever, which had been so prevalent during the latter months of 1911, had gradually become less so, and during the last three months there has not been any reported to me. The last case reported to the local registrar was on September 30th, and there has been none reported in the Sarnia General Hospital since November 9th.

Since January last, samples of water have been sent to Dr. Amyot every week, at first three times a week, latterly once a week. These samples have been taken from the intake pipe which means river water before it has been chlorinated.

I have Dr. Amyot's reports on these samples and no colon bacilli or other harmful bacteria have been found in the water since his report of September 28th, 1912.

During 1912 the Town has been comparatively free from infectious diseases.

Only one case of smallpox of the modified type, eight cases of scarlet fever, mostly in a mild form, and fourteen cases of diphtheria have been reported. At the present time there is no house in Town under quarantine for any infectious disease.

During the year I have been employed portions of 137 days on Board of Health business.

I have made 23 visits to infected houses, and to premises where an insanitary condition was reported to exist.

I have investigated 25 complaints of nuisances, and where they were found to exist had them abated.

I have attended 9 meetings of the Board and members of the Provincial Board.

I have twice attended at the Police Court in trials connected with nuisances.

I have written and received several letters on Board of Health business principally from the Provincial Board.

On the 26th of August I examined and tested 17 samples of milk collected from the vendors supplying the town and the result was fairly satisfactory.

SAULT STE. MARIE, ONT.

DR. A. S. MCCAIG, M.O.H.

I beg to submit my report of the sanitary condition of the City of Sault Ste. Marie for the year 1912.

VITAL STATISTICS.

Births	247
Deaths	246
Marriages	192

INFECTIOUS DISEASES.

1. *Typhoid Fever.* During the year there have been 53 cases of this disease. Of these probably 25 originated in the city. Last year there were 125 cases with 40 from the city. There were 11 deaths from this disease.

2. *Scarlet Fever.* 4 case, no deaths.

3. *Measles.* This disease was prevalent during the first half of the year. Seven deaths resulted from measles or its complications. It is now compulsory to isolate patients suffering from measles, and houses in which the disease occurs must be placarded.

4. *Whooping Cough.* A few case at present in the city.

5. *Tuberculosis.* This disease still maintains its lead of all the infectious diseases. There were 21 registrations of death from tuberculosis of all kinds during the year. All the deaths from this disease were not from the City, as a number of deaths which occurred on the Garden River Indian Reserve were registered here.

6. *Diphtheria.* This has been the plague of the year. There have been 97 cases of the disease with 9 deaths. In my reports for the past two years I have urged the necessity of an isolation hospital for the care of cases of the infectious diseases. You cannot appreciate the worry we have had in trying to provide accommodation for cases of infectious diseases that have occurred in boarding houses, hotels, banks, etc., and

I would especially thank His Worship, The Mayor, for his cordial assistance and support during the past year. I am pleased to know that it is to be to the credit of your present honorable body that steps are now being taken to provide an isolation hospital for the city. I would like to advise that now the matter is assuming definite shape that a thoroughly up-to-date building be erected and not some old patched up concern in which the public will have no confidence and of which Health Officers and everyone else will be ashamed.

We must have a place with which no objections as to the location, construction or management can be found. The majority of infectious diseases occurs in children and parents will not permit and physicians will not advise their removal to an isolation hospital which is not thoroughly up-to-date and in which the public and physicians alike have not every confidence.

Acting under instructions from the Board of Health I have recently impressed into the service of the Board as a temporary Isolation Hospital, No. 119 Pilgrim Street. This building is serving our purposes admirably and we have at present 7 patients in the hospital.

There seems to be a very strong prejudice on the part of most people to having an isolation hospital within forty rods of them. This prejudice is founded on the assumption that there is danger from contagion from the hospital to inmates in houses nearby. It has been proven that danger in this way does not exist, that the contagion is confined to a very limited area about the patient and that the danger is only to those who come into immediate contact with the patient. If the doctors and nurses who are attending the patients take precautions against taking the disease themselves, there is very little danger of either carrying the disease to anyone else. It is also a fact that infectious diseases are not more prevalent in the neighborhood of the isolation hospitals in cities than in the parts more remote from the hospitals.

There also seems to be a popular repugnance to the names isolation hospital and especially pest house (with which I sympathise), which has survived from the days when the poor victim of plague or smallpox was thrown into some vile den to die, neglected and alone.

There is also another objection to the location of an isolation hospital in certain districts, and that is that it depreciates the value of adjoining property. This objection seems to be especially strong in this city where so many are interested in real estate speculations, large and small, and it would also seem that the ones who have the least invested are the ones who are able to make the loudest noise in opposition.

It is right, however, that all these objections should have due consideration in selecting a site for the hospital, but at the same time it must not be forgotten that the main purpose is to protect the public health by providing a modern institution for the care of those who are suffering from infectious diseases.

Dr. R. E. Wodehouse, District Health Officer of the Provincial Board of Health, visited the city recently to investigate the cause of the prevalence of diphtheria. After a thorough investigation of all the circumstances in connection with the outbreak, he gave the following reasons for the continuance of the disease:

1. Missed cases or cases in which the disease was so mild that no medical treatment was obtained, no measures of isolation or disinfection were taken, the child returned to school or mingled with the public, still carrying the contagion, and in this way other people were infected.
2. No adequate means provided by the city for isolating the cases.
3. Not a sufficiently long and rigid quarantine by the Health Officers of houses where the disease occurred.

It is the duty (as provided by the Public Health Act) of every householder if he knows or suspects the existence of a communicable disease in his household to give notice thereof, within 12 hours, to the Secretary of the Board of Health or the Medical Officer of Health.

It is the duty of the city to provide a thoroughly up-to-date isolation hospital.

It is the duty of the Medical Officer of Health to enforce in a fair and fearless manner the Regulations of the Provincial Board of Health regarding communicable diseases.

Now, if all cases are promptly reported, if an isolation hospital is provided, and if people observe, or be made to observe a strict quarantine, the disease will soon be stamped out.

Quarantine seems to procure in some people a peculiar perversion of their sense of responsibility. They resent the restrictions placed upon them when denied their liberty for the protection of others. They would be horror-stricken if you suggested that they would give their neighbor's child a dose of poison, yet they are willing to expose it to the deadly poison of an infectious disease.

A mad dog in the street would create a panic. The last report of the Registrar General does not report a single death from hydrophobia in the whole Province of Ontario, yet here in Sault Ste. Marie we had nine deaths from diphtheria during the year,

and there are people in the city ignorant enough to not believe that it is diphtheria, and others malicious enough to ignore precautions against the spread of the disease.

The by-law to raise money for the building of an incinerator should be strongly supported. The disposal of garbage has been a difficult and expensive work, and with which the Board of Health has had to deal. I think when the incinerator is built it would be well to consider the advisability of placing the collection of garbage in charge of the sanitary committee of the Board of Works, and have the work done in the same manner as the street cleaning. The sanitary inspector has already too much to do, and if he were relieved of the oversight of the collection of garbage, he could devote his time more freely to the inspection of dairies, shops, restaurants, boarding houses, etc., and be able to give more thorough attention to the various duties imposed upon him by the Public Health Act.

Dairies and Milk Supply.

The dairies were inspected by the sanitary inspector and members of the Board of Health. A great improvement has been made in the condition of the stables and in cleaner methods of handling milk. Milk tests were made regularly.

Slaughter Houses and Butcher Shops.

The butcher shops have been kept in a clean and sanitary condition during the year. The meat supply has been good. We need a public abattoir where animals can be inspected before being slaughtered and where carcasses can also be properly examined. We have men in the meat business in the city who are ready to invest their money in an abattoir as soon as permission is given them to build one. It can be built by private capital and still be under municipal control.

The Board of Health.

This has been an active organization during the year and has done good work in guarding the public health.

The Ontario Health Exhibit of the Provincial Board of Health was exhibited in the city this summer. The Exhibit is sent to various parts of the Province as a means of educating the public in matters pretaining to the public health. In addition to the regular features of the Exhibit, lectures were delivered by the doctors of the city on various health topics.

During the year the Board held thirteen meetings which were attended by the members as follows:

J. Huston, Chairman, 13; R. Brydges, 13; W. H. Harper, 11; W. H. Ewing, 11; S. W. Fawcett, 11; W. R. Cunningham, 6; His Worship, 4; Medical Health Officer, 12.

The local Board of Health will require reorganization at the beginning of the New Year, to conform to the provisions of the new Public Health Act.

This new Act, which has been in force since April, imposes very arduous duties upon the Medical Officer of Health. He is the executive officer of the local Board and is responsible for the carrying out of any regulations it may make, and also those of the Provincial Board and the health by-laws of the municipality. This means that the whole health work falls upon the Medical Officer of Health, and in this city it is no small matter to attend to.

More work means more salary and with report I am also presenting my account for services for 1912.

REGULATIONS

OF THE

Provincial Board of Health

ONTARIO

APPROVED BY THE LIEUTENANT-GOVERNOR IN COUNCIL,
ON THE 10th DAY OF AUGUST, 1912

Table Showing Period of Quarantine and Date of Return to School, according to Section 72 of the Public Health Act.

Disease.	Quarantine required after last exposure to infection.	Earliest date of return to school after attack.
Smallpox	14 days.	When all scabs have fallen off.
Chickenpox	14 "	When all scabs have fallen off.
Measles	16 "	3 weeks, if all desquamation and cough have ceased.
Scarlet Fever	10 "	6 weeks, if convalescence is complete, and no desquamation, albuminuria, sore throat, nasal or aural discharges remain.
Diphtheria	12 "	3 weeks, if convalescence is complete, and no sore throat, nasal or aural discharges remain; or if after 12 days two negative swabs with a 12-hour interval are shown to the satisfaction of the M. O. H.
Whooping Cough	14 "	6 weeks after the commencement of the whooping, if the characteristic spasmodic cough and whooping have ceased —earlier if all cough gone.
Rotheln—German Measles	16 "	3 weeks.
Mumps	18 "	4 weeks if all swelling has subsided.
Typhoid Fever		8 weeks if convalescence is complete.
Itch, Ringworm and other skin diseases Ophthalmia Neonatorum Trachoma Pediculosis Impetigo Contagiosa		As soon as local affections are cured.

REGULATIONS FOR THE CONTROL OF COMMUNICABLE DISEASES.

NOTE.—Containers for samples of sputum, culture tubes for diphtheria swabs, and slides for blood samples may be procured free by physicians from their local M. O. H. These will be examined free of charge and prompt report made by the Laboratory of the Provincial Board of Health, Toronto, or by the branches at Kingston and London.

REGULATION 1.—The Medical Officer of Health of every municipality where a patient is suffering from scarlet fever, measles, diphtheria, leprosy, smallpox, cholera, bubonic plague, epidemic anterior poliomyelitis, or epidemic cerebro-spinal meningitis, *shall* forbid, by notice posted upon the entrance to premises in plain view of the public, any person except the attending physician, health officer, clergyman, nurse, sanitary inspector or, in case of death, the undertaker, from going to or leaving such premises without his permission, or the carrying off, or causing to be carried off, any material or article whereby such disease may be conveyed, until after the disease has abated and the premises, dwelling, clothing and other contents have been rendered free from danger by means of such disinfection and cleansing as the Provincial Board of Health may direct, and he shall prescribe the precautions to be taken.

A quarantine card must give the name of the disease and in every way conform to Rule 31 of Schedule B of the Public Health Act, as follows:

"The Medical Officer of Health, within six hours after he has received notice of the existence in any house of any communicable disease in respect of which it is his duty to do so, shall affix, or cause to be affixed, near the entrance of such house a card at least nine inches wide and twelve inches long, stating that such disease exists in the house, and stating the penalty for removal of such card without the permission of the Medical Officer of Health, and no person shall remove such card without his permission."

REGULATION 2.—The Medical Officer of Health may name upon such card the period of quarantine required.

REGULATION 3.—Sections 49, 50, 57, 58, 60, 62, 64, 66, 67 and 71, and Rule 31 of Schedule B, of the Public Health Act, shall apply to the following communicable diseases, viz.: Smallpox, scarlet fever, diphtheria, chickenpox, whooping cough, measles, typhoid fever, cholera, bubonic plague, leprosy, epidemic anterior poliomyelitis and epidemic cerebro-spinal meningitis; except that, while all of these diseases are required to be kept isolated from the public, whooping cough, chickenpox and typhoid fever need not be placarded.

REGULATION 4.—In cases of diphtheria, scarlet fever, measles, cholera, bubonic plague, epidemic anterior poliomyelitis, or epidemic cerebro-spinal meningitis, the Medical Officer of Health may, if he is satisfied of the effectual isolation of the patient, permit those who do not have the direct care of the patient or patients to leave the premises in order to attend their regular duties, except when such individuals are employed or in any way engaged in the handling or preparing of articles for food or clothing, or are associated with children away from the quarantined house.

Teachers or children in the quarantined house who are in attendance at school, college, university, or other institution of learning, must be excluded

therefrom while their home is under quarantine. The patient or patients and those having charge of them must be under rigid quarantine as directed in Regulation 1.

REGULATION 5.—The Medical Officer of Health shall be satisfied that the cleansing and disinfection of any house, building, car, vessel or vehicle, or any part thereof and of any articles therein likely to retain infection, are satisfactorily carried out before the quarantine is removed.

REGULATION 6.—When furniture, bedding, clothing, carpets or other articles that have been exposed to infection through contact with infected persons or articles cannot be disinfected, they may be destroyed by order of the local Board of Health or Medical Officer of Health, and the Board may make recompense therefor.

REGULATION 7.—No person shall let for hire, cause or permit any one to occupy apartments previously occupied by a person ill with smallpox, scarlet fever, diphtheria, measles, cholera, bubonic plague, epidemic anterior poliomyelitis, epidemic cerebro-spinal meningitis, whooping cough, chickenpox, typhoid fever, glanders, erysipelas, tuberculosis, mumps, leprosy, anthrax or rabies until such apartments shall have been disinfected under the supervision of the Medical Officer of Health or official acting under his instructions, in accordance with the requirements of the Provincial Board of Health.

REGULATION 8.—Whenever the order or direction of the Medical Officer of Health, requiring the disinfection of articles, premises or apartments, is not complied with, the Medical Officer of Health shall forthwith cause to be placed upon the door of the apartments or premises a placard in word and form as follows:

WARNING.

.....Ontario.

.....is a communicable disease. These apartments have been occupied by a ..... patient and may have become infected. They must not be again occupied until my orders directing their renovation and disinfection have been complied with.

This notice must not be removed, under penalty of law, except by an authorized health official.

.....
Medical Officer of Health.

Dated, ..., 19 .

REGULATION 9.—No person shall work or be permitted in or about any establishment for the manufacture or handling of food products or clothing during the time in which a case of smallpox, scarlet fever, or diphtheria exists in the house in which he resides until the Medical Officer of Health has given such person a written certificate to the effect that no danger to the public will result from his employment in such establishment.

EPIDEMIC CEREBRO-SPINAL MENINGITIS AND EPIDEMIC ANTERIOR POLIOMYELITIS.

REGULATION 10.—Every case of epidemic cerebro-spinal meningitis and epidemic anterior poliomyelitis shall forthwith be reported to the Secretary of the local Board of Health. The patient shall be isolated. The discharges from the nose, throat and mouth of the patient must be received on cloths and burned at once. After death or recovery of the patient all personal clothing and bedding, together with the contents of the room and the room itself, must be thoroughly disinfected under the personal supervision of the Medical Officer of Health. Every doubtful case of this character must be classed as epidemic and cared for accordingly until proved to be otherwise.

SCARLET FEVER, SCARLATINA, SCARLET RASH.

REGULATION 11.—The Medical Officer of Health, having knowledge of or having reason to suspect the existence of scarlet fever, shall investigate, if necessary, and shall at once place under quarantine all persons found to be suffering from, or suspected of suffering from, scarlet fever, and those having the care of or coming in contact with such persons, except such as mentioned in Section 1 of the Regulations for the Control of Communicable Diseases.

The period of quarantine for scarlet fever shall not be less than SIX (6) WEEKS, and may be longer. Quarantine must not be raised until the Medical Officer of Health has satisfied himself that there is no further danger of infection from the patient. The quarantine must not be raised, unless the infected patient be removed or die, until six weeks or more, as the case may be, after the appearance of the last case in such family or household.

REGULATION 12.—The apartments occupied by a scarlet fever patient shall be deemed infected, and when vacated by death or removal of the patient shall, together with the contents, be thoroughly disinfected under the supervision of the Medical Officer of Health. All persons having occupied such apartments during the quarantine period must have their clothing disinfected and take disinfecting baths before being released from quarantine. All disinfection prescribed in the Regulations shall be part of the control of the disease.

REGULATION 13.—No milk container shall be returned to any dairy or milk vendor from a house where scarlet fever exists.

REGULATION 14.—No milk, butter or other dairy product shall be sold or given to any party or delivered to any creamery or butter factory from a house where scarlet fever exists.

REGULATION 15.—Every physician shall report forthwith in writing to the Secretary of the local Board the death of any scarlet fever patient under his care within twelve (12) hours thereafter.

REGULATION 16.—The Secretary of the local Board of Health must report at least weekly to the Secretary of the Provincial Board of Health all cases of scarlet fever occurring within his municipality.

DIPHTHERIA.

Regulation 17.—A suspicious case of diphtheria must be quarantined until the diagnosis is confirmed or disproved. An undoubted clinical case of diphtheria must be quarantined even if the laboratory examinations give negative findings.

Regulation 18.—The quarantine of diphtheria in public institutions where the population *is resident* shall be governed by both clinical and laboratory examinations. Immediately after the appearance of diphtheria in an institution the Medical Officer of Health shall notify the Secretary of the Provincial Board of Health, who shall supply facilities for taking cultures, if necessary, from all residents of the institution. All individuals, whether sick or well, who are found in the institution harbouring diphtheria bacilli shall be quarantined until a negative report is made upon nose and throat cultures. They shall then be properly cleansed and disinfected and placed in other detention quarters until two later and successive negative reports on double examinations of nose and throat are made, whereupon they may be released after proper disinfection.

Regulation 19.—The apartments occupied by a diphtheria patient shall be deemed infected and when vacated by death or removal of the patient shall, together with their contents, be thoroughly disinfected in the manner prescribed in the instructions *re* disinfection as issued by the Provincial Board of Health. All persons having occupied such apartments during the quarantine period must have their clothing disinfected and take disinfecting baths before being released from quarantine. All disinfection prescribed in the Regulations shall be part of the control of the disease.

Regulation 20.—No milk container shall be returned to any dairy or milk vendor from a house where diphtheria exists.

Regulation 21.—No milk, butter or other dairy product shall be sold or given to any party or delivered at any creamery or butter factory from a house where diphtheria exists.

Regulation 22.—Every physician shall report forthwith in writing to the Secretary of the local Board of Health the death of any diphtheria patient under his care.

Regulation 23.—The Secretary of the local Board of Health must report at least weekly to the Secretary of the Provincial Board of Health all cases of diphtheria occurring within his jurisdiction.

Regulation 24.—So-called membranous croup shall be classed, quarantined and cared for as diphtheria.

MEASLES.

Regulation 25.—Persons suffering from measles must not be allowed to leave the premises until after the expiration of the period of quarantine as set forth in the Regulations of the Provincial Board of Health.

WHOOPING COUGH.

REGULATION 26.—Persons suffering from whooping cough must not be allowed to leave the premises until after the expiration of the period of quarantine as set forth in the Regulations of the Provincial Board of Health.

CHICKENPOX.

REGULATION 27.—Persons suffering from chickenpox must not be allowed to leave the premises until the expiration of the period of quarantine as set forth in the Regulations of the Provincial Board of Health, and not then unless desquamation is fully completed.

TYPHOID FEVER.

REGULATION 28.—A physician in attendance upon a case of enteric (typhoid) fever, or suspected enteric fever, shall report the same within twelve (12) hours to the Secretary of the local Board of Health, who shall in turn report at least weekly to the Secretary of the Provincial Board of Health all cases so reported to him upon blanks furnished for that purpose.

REGULATION 29.—The Secretary of the Provincial Board of Health shall keep careful and accurate record of all reported cases of typhoid fever. The same shall not be for publication, but may be used by the said Board in the discharge of its duties.

REGULATION 30.—No person affected with typhoid fever or in charge of a typhoid patient shall so dispose of the excreta or other infectious bodily secretion or excretion so as to infect or cause offence or danger to any person or persons, and all fæcal discharges shall be placed in a vessel containing an equal quantity of 1-in-500 solution of bichloride of mercury for at least one hour before being finally disposed of.

REGULATION 31.—It shall be the duty of those having charge of a typhoid fever patient or patients to see that the excreta and other infectious bodily secretions or excretions from such patient or patients are properly disinfected.

REGULATION 32.—The apartments occupied by a typhoid fever patient shall be deemed infected, and when vacated by death or removal of the patient shall, together with their contents, be thoroughly disinfected under the supervision of the Medical Officer of Health. All disinfection prescribed in this rule shall be part of the control of the disease.

REGULATION 33.—The Medical Officer of Health in cities, towns and villages shall keep in his office a map of the municipality and shall mark thereon the lot, street or other place where the case of typhoid fever or suspected typhoid fever occurred, and shall also make a further distinguishing mark where the death of a patient is reported to him.

RABIES.

Regulation 34.—When an animal suspected of having rabies has bitten a human being, the fact should be immediately reported to the Medical Officer of Health, who shall secure, or cause to be secured, such animal alive and without injury if possible. The animal shall at once be safely chained up and confined in a safe and comfortable place and a report, giving full particulars concerning the action taken, sent to the Secretary of the Provincial Board of Health. This report shall include the name of the locality in which the biting occurred (city, town, village or township), the date of biting, the name, residence and address of the owner of the animal, the full name of the person bitten, together with place of residence, and the names, addresses and residences of all owners of animals which have been bitten by the animal in question, together with a list and description of the animals bitten and the disposition made of the same.

Such supposedly rabid animal must be kept under careful observation by the local Officer of Health for at least ten days.

Regulation 35.—When such suspected animal is killed, care must be taken not to injure the brain or spinal cord. The head and several inches of the neck of the animal must be cut off and sent to the Laboratory of the Provincial Board of Health.

Regulation 36.—All persons bitten by an animal suspected of having rabies should at once communicate with the Secretary of the Provincial Board of Health and be advised as to the necessity of receiving the Pasteur treatment.

Note.—At present, Pasteur treatment is supplied at cost ($20.00) by the Provincial Board of Health at No. 5 Queen's Park, Toronto.

SMALLPOX REGULATIONS.

Regulation 1.—Where smallpox is present in any municipality in Ontario, the local Board of Health of the municipality shall at once appoint one or more sanitary policemen for the purpose of assisting to arrest the spread of the disease.

If the Medical Officer of Health or the Provincial Board requires the appointment of any specified number of sanitary policemen, then such number shall be appointed by the local Board. In case the local Board neglects or refuses to make the required appointment, the Provincial Board may appoint as many sanitary policemen for such municipality as it deems necessary.

Regulation 2.—Any default on the part of the authorities of any municipality in taking immediate and effective action in carrying out the Public Health Act, the Vaccination Act, the Regulations of the Provincial Board of Health, or any health by-law in force in the municipality, shall be at once reported by the Medical Officer of Health to the Secretary of the Provincial Board, in order that the said Board may take such measures as it deems necessary for placing the said municipality in a position to effectively combat the disease.

Regulation 3.—If any person coming from abroad or residing in any municipality within Ontario is infected, or has recently been infected with or exposed to smallpox, the Medical Officer of Health or local Board shall make effective pro-

vision for the public safety by removing such person to a separate house, or by otherwise isolating him, and by providing medical attendance, medicine, nurses, and other assistance and necessaries for him.

Regulation 4.—The Medical Officer of Health shall take proper measures for the disinfection or, if necessary, the destruction of all clothing which may have been exposed to the contagion, and for the disinfection and purification of every premises which may have been exposed to the contagion.

Regulation 5.—The Medical Officer of Health shall have power to place in another building or tent, which shall be provided by the local Board, all persons who may have been exposed to the contagion, and in such case shall supply them with all necessaries until the period of incubation of the disease shall have elapsed, and no such person shall go or be permitted to go abroad until he has given satisfactory proof of successful vaccination within the preceding seven years or shall have obtained a medical certificate of insusceptibility to the vaccine disease, nor until the clothing or effects worn or carried by or with him have been properly disinfected, if the same have been exposed to contagion.

Regulation 6.—When any vessel coming from an infected locality enters any port in Ontario, the Medical Officer of Health having jurisdiction in the port shall make a strict inspection of the vessel and examination of the passengers, officers and crew, luggage, clothing, bedding, freight or other effects before any person, luggage, freight, or other thing is landed or allowed to be landed from it, and where any infected or exposed person is found on board, he shall be dealt with in the manner directed in the preceding Regulation numbered five, and no luggage, freight or other thing shall be landed from the vessel until they have been thoroughly disinfected.

Regulation 7.—With a view of preventing, by means of a systematic inspection of passengers, baggage and cars, the introduction of infected persons, things and conveyances into the Province, the Provincial Board may, if an epidemic of smallpox exists in any other locality, appoint medical inspectors who shall perform such duties as may be assigned to them by the Board, and may board all trains entering this Province from such other locality and all boats bearing passengers from such other locality to Ontario ports, and any other train or boat suspected of having infected persons, luggage, freight or other effects on board. Every such inspector may take in respect of such persons, luggage, freight or effects any sanitary precaution authorized by the Public Health Act or by any Regulations issued by the Board.

The inspector may require any person travelling on any such train or boat either to produce for examination by the inspector a medical certificate of such person having been vaccinated within the preceding seven years or of being insusceptible to the vaccine disease, or to exhibit to such inspector the marks on his person of successful vaccination, such as to satisfy the inspector that the same has been performed within seven years. In default thereof, the inspector is empowered to vaccinate such person either before he is permitted to leave the train or boat, or immediately thereafter, at his discretion.

Each person so travelling shall answer truthfully all reasonable questions which an inspector shall, in the performance of his duty, ask such person with reference to the places where such person has been and his stay there during the twenty-

one days next preceding such inquiry being made; and in case any such person refuses or omits so to do, the inspector shall be justified in presuming that such person has within such time been exposed to infection and in acting accordingly.

Regulation 8.—The Medical Officer of Health and all other sanitary officers shall, whenever required by the medical inspectors appointed by the Provincial Board, aid such inspectors in providing for and compelling the removal of suspected or infected persons from trains or boats, and for isolating and vaccinating such persons, and for supplying them with medical aid; and the expenses attendant upon the discharge of such duties shall be borne by the Provincial Board in all cases where the persons for which they are performed are unable to pay therefor, and are not residents in the municipality in which they are taken care of, or as otherwise provided for by the Sanitary Regulations of Unorganized Territories.

Regulation 9.—In every municipality where smallpox exists, or in which the Provincial or local Board of Health has notified the Council that in its opinion there is danger of its breaking out owing to the facility of communication with infected localities, the Council of the municipality shall order the vaccination and re-vaccination of all persons resident in the municipality who have not been vaccinated within seven years, and that such vaccination or re-vaccination shall be carried out in so far as the same may be applicable in the same manner as the vaccination of children, except that a person of fourteen years of age or over but under the age of twenty-one years, who is not in the custody or under the control of his father, mother, or of any other person, and every person of twenty-one years or over, shall present himself for vaccination by the medical practitioner, or by some other legally qualified medical practitioner, and the medical practitioner shall adopt the same measures to secure the vaccination or re-vaccination of every such person, as he is required to take with regard to children.

Regulation 10.—A proclamation issued by the head of the municipality and published in posters and in at least one newspaper published within the municipality, or, if there is no such newspaper, in at least one newspaper published in the county or district in which such municipality is situate, warning the public that this section is in force, shall be sufficient evidence to justify the conviction of any person who has failed to comply with the law within a period of seven days from the publication of the proclamation.

Regulation 11.—Every member of a municipal council which neglects or refuses to make the order required by Regulation 9 or to make proper provision for carrying the same into effect, shall incur a penalty not exceeding $25, unless he proves that he did everything in his power to secure the making of the order or the making of proper provision for carrying any such order into effect, and causes his protest against such refusal or neglect to be recorded in the proceedings of the Council.

Regulation 12.—If the head of a municipality neglects or refuses to issue and publish the proclamation required by Regulation 10, he shall incur a penalty not exceeding $25.

Regulation 13.—Every person who wilfully neglects or refuses to obey the order of the Council shall incur a penalty not exceeding $25.

REGULATION 14.—Where it is deemed necessary by the Medical Health Officer of any municipality, owing to the presence or threatened presence of smallpox, he may, with the approval of the local Board of Health, require certificates of successful vaccination or of insusceptibility on re-vaccination within seven years of all pupils or students of a public, separate, continuation or high school or collegiate institute and of a college or university, or of any other public or private institution of learning within the municipality, to be presented to the proper authorities of the institution, and no pupil or student refusing to produce such certificate on demand shall be admitted to further attendance in the institution until the certificate is furnished.

REGULATION 15.—Any principal, teacher, superintendent or officer of any such institution who commits or is party or privy to any contravention of Regulation 14 shall incur a penalty not exceeding $20.

REGULATION 16.—The medical inspectors to whom is assigned the duty of inspecting trains and boats coming from outside the Province upon which smallpox exists, or is suspected to exist, shall be governed by the following rules:

(1) They shall examine all persons thereon, note whence they have come, their destination, and whether there is any reason to suspect their being infected with smallpox.

(2) The effects of persons regarding whom there is suspicion should be dealt with as directed by the Public Health Act.

(3) If an inspector believes that any such person is infected or that his clothing or other effects contain infection, the inspector shall detain such person, his clothing and effects as aforesaid, at some convenient point *en route* until the period of incubation is over and the clothing and other effects shall be at once disinfected.

(4) If a medical inspector only suspects that any person on board, or the effects of any such person have been exposed to infection, the inspector shall notify the Medical Officer of Health of the municipality to which the person is going, to meet the train or boat and to keep said person thereafter under observation.

(5) In either of the cases mentioned in the two next preceding rules, unless the person believed to be conveying or suspected of conveying contagion shows satisfactory proof of vaccination within seven years or of insusceptibility to the vaccine disease, he shall forthwith be vaccinated; and, if necessary, shall be detained by the Medical Officer of Health until vaccinated by him or some other proper person.

REGULATION 17.—The action to be taken in the event of a case of smallpox being discovered is, shortly, as follows:

(*a*) Detention and isolation of persons affected.
(*b*) Fumigation of car or boat.
(*c*) Vaccination of all persons who have been exposed to the contagion.
(*d*) Detention of any such person who refuses to be vaccinated.
(*e*) Notification of Medical Officers of Health at places of destination.

REGULATION 18.—In all cases, Medical Officers of Health and other sanitary officers are required to use extreme care, tact, and judgment in dealing with the public, so that having regard to the public safety, persons travelling are not unnecessarily detained.

ACT RESPECTING SANITARY REGULATIONS

IN

UNORGANIZED TERRITORIES

AND

REGULATIONS FOR THE SANITARY CONTROL

OF

LUMBER, MINING

AND

CONSTRUCTION CAMPS,

Etc., Etc.

In Unorganized Districts of Ontario, with Information required by the Provincial Board of Health.

SPECIAL NOTICE TO EMPLOYERS OF LABOUR IN THE UNORGANIZED DISTRICTS OF ONTARIO.

Attention is directed to the following requirements of the Regulations:

1. Notify the Provincial Board of Health forthwith of each camp or works you are now operating and send notice annually hereafter.

2. A physician must be engaged to supervise the sanitary conditions of each camp and works. He must inspect monthly and report in writing to the Provincial Board of Health.

3. Every employer of labour, other than lumbermen, must contract with a physician for the medical and surgical care of employees, the maximum amount that can be legally deducted from an employee's wage for such service being one dollar per month without rebate or deduction.

4. Employers of labour in lumber camps must particularly note that they have the option of employing a physician, as provided by Regulation 3.

Those lumbermen who do not contract incur certain personal responsibilities regarding the medical care of employees taken ill while in their employ or who may develop an illness, origin of which is traceable to the time of their employment.

5. Every employer shall transmit a copy of contract to the Provincial Board of Health.

6. The owner, manager, agent or foreman of each camp or works is responsible for the enforcement of these Regulations and the provisions of the Public Health Act as regards quarantining and isolating of employees.

7. Every employer who neglects to enforce the Public Health Act in each camp or works is subject to penalties.

8. The Provincial Board of Health must be notified at once of each case of communicable disease.

9. Each employee, when requested, shall show a certificate of successful vaccination or re-vaccination.

10. Each camp or work is required to have hospital accommodation for employees, and in addition each camp or works must have separate isolation hospital accommodation for communicable diseases.

11. The Regulations 11 to 18, inclusive, relate to the construction and sanitary conditions of buildings, lavatories and closets; they require the providing of a laundry house, bath house and kitchen, and require the collection and proper disposal of garbage.

12. Penalties for non-compliance with these Regulations are those contained in Section 109 of the Public Health Act.

The Following Sections of the Public Health Act Refer to Unorganized Territories.

116.—Sections 117 to 123 shall apply only to territory without municipal organization.

117.—(1) The Provincial Board of Health may, with the approval of the Lieutenant-Governor in Council, make regulations:

(*a*) Respecting any industry and the conditions under which the same may be carried on, for the purposes of preventing nuisances and the outbreak or spread of disease;

(*b*) For the cleansing, regulating and inspection of lumbering camps and of mining camps and railway construction works and of other places where labour is employed;

(*c*) For providing for the inspection of houses and premises;

(*d*) For providing for the employment of duly qualified medical practitioners by employers of labour in lumbering camps and in mining camps and on railway construction works and other works where labour is employed, and for the erection of permanent or temporary hospitals for the accommodation of persons so employed.

(2) The regulations may be general in their application or may be made applicable specially to any particular locality or industry.

(3) The expenses of carrying out the regulations shall be paid to the person entitled thereto by the persons, firms or corporations whose duty it may be to carry out such regulations, and the amount so to be paid shall be apportioned by the Minister among them as he may deem proper, and every amount so apportioned shall be deemed to be a debt due from the person, firm or corporation, and may be recovered by the person entitled thereto by action in any court of competent jurisdiction. 1 Edward VII. c. 34, ss. 1-3.

(4) If default is made in complying with any of the regulations, the Board may direct that what is omitted to be done shall be done at the expense of the person, firm or corporation in default, and if the default is the failure to employ a duly qualified medical practitioner, as provided by clause (*d*) of subsection (1), the employing person, firm or corporation shall be liable to pay the reasonable expenses incurred by any employee for medical attendance and medicines, and for his maintenance during his illness.

REGULATIONS FOR THE SANITARY CONTROL OF LUMBER, MINING AND OTHER CAMPS, SAW MILLS AND OTHER INDUSTRIES SITUATED IN THE UNORGANIZED DISTRICTS.

Employers to notify Provincial Board of establishment of each camp forthwith and annually.

1. Every employer of labour on any work in any lumbering, mining, construction or other camp, saw mill and other industry situate in any portion of the unorganized districts without municipal organization, shall, upon the establishment of each and every camp and work, forthwith notify the Provincial Board of Health of the establishment of the same, and annually thereafter upon a date fixed by the said Board, giving particulars as may be required by the said Board.

All employers to contract with physicians for supervision of camps and monthly inspection of same

2. Every employer of labour on any such work shall contract with a duly qualified physician for the sanitary supervision of camps, dwellings, or works, and such physician shall inspect the same at least once a month or oftener, if, in the opinion of the Chief Officer of Health, the health conditions of the Province require it, and shall forthwith report in writing to the Provincial Board; the first report, however, to be accompanied by a sketch or plan of each camp, showing the location

of the various buildings, with distance apart, location of water supply, slopes of ground with drainage, and such other information as may be required by the Provincial Board.

Employers (except lumbermen) to contract with physicians for medical and surgical care of employees; they may deduct from wages a sum not exceeding $1.00 per month.

3. Every employer of labour on any work other than a lumber camp shall contract with one or more *duly qualified physicians* for the medical and surgical care of his employees; and may deduct from the pay due any employee a sum not exceeding $1.00 per month, which shall be paid to the physican or physicans so contracted *without rebate or deduction*, and every such *physician* shall supply medical attendance and medicine to the employees.

Lumbermen have option of employing physicians, but in lieu thereof assume certain responsibilities.

4. Every employer of labour in a lumber camp may contract with one or more duly qualified physicians in the manner hereinbefore provided, and in that case may proceed in the manner authorized by the said regulations, and every physician so contracted with shall possess the powers and perform the duties set out in the next preceding regulation, but every such employer who does not contract for the medical attendance of his employees shall be responsible for the medical care and maintenance of each and every employee taken ill while in his employ, and shall incur a like responsibility for each and every case of sickness which develops in an employee after quitting his service or after being discharged from his employ when, in the opinion of the Provincial Board, the origin of such sickness is traceable to the period of such employment, or to an accident to an employee occurring while in such employ, when the sick or injured person is not able to pay or does not pay for the same—the apportionment and adjustment of the payment of expenses so incurred to be determined according to section 117, subsection 3, chap. 58, 2 George V.

Copy of contract to be forwarded to Provincial Board, which for reasons may require changes in manner herein set forth.

5. Employers of labour on all works in the unorganized districts without municipal organization shall transmit, at the time of the making of the contract, a copy of the same to the Secretary of the Provincial Board of Health, and notice of any subsequent change made in their physicians, or of changes in the contracts between the two contracting parties. Should it appear to the Provincial Board, owing to the distance of the residence of the physician employed from the camps of the company, that the best interests of the employees are not likely to be served, it shall be competent for the said Provincial Board, with the approval of the Minister, to require any employer of labour in such district to contract with some physician residing at or near the works of the company. Should it further at any time appear, owing to the distance of the physician from the camps, or to neglect, or other cause on the part of the company or physician employed, that an employee has been put to expense to secure the medical assistance for sickness or accident other than of employer's physician, the employer and physician shall be held responsible for the payment of a reasonable fee for medical services, the amount to be paid in such

instances to be determined in case of dispute by the Minister or the Department, under section 117, subsection 3, chap. 58, 2 George V.

Owner, Manager, etc., responsible for carrying out of Regulations and Health Act.

6. The owner, manager, agent or foreman of any lumbering camp, mining camp, saw mill, smelting works or other industry, or of any railway construction camp located in any portion of the unorganized districts without municipal organization, shall in connection with every such industry or works be responsible for the execution and enforcement of any regulation herein contained, or of any clause of the Public Health Act governing in any case or circumstance.

The same measures taken by local health authorities to be adopted by employers, agents, etc., in the case of communicable diseases.

7. Every measure required to be taken by a local Board of Health or any Medical Officer of Health, sanitary inspector or other health officer under the Public Health Act, or any regulation made thereunder in any organized municipality, must at once be taken by the employer and his employees or agents, or the physician employed by the same, whenever any suspected communicable disease referred to in the said Public Health Act or Regulations, breaks out in any camp, works or dwelling to which these regulations apply, and the said employer, manager, foreman, agent or physician employed shall be subject to the same penalties as any of the aforesaid health officers.

Provincial Board to be notified forthwith of each and every case of a communicable disease.

8. Should any suspected communicable disease, as defined under the Public Health Act, break out in any camp, works or dwelling, the employer or his employee or agent in charge of any camp, work or dwelling, shall immediately send notice to the physician employed, who shall at once notify the Secretary of the Provincial Board of the outbreak. In all respects the employer, his employee or agent in charge of any camp, works or dwelling, shall be held to be in the same position as regards the occurrence of communicable disease therein as a householder, and shall conform to sections 53, 54 and 60, and such other sections of the Public Health Act and Regulations as may relate to the duties of the householder.

Employees in camps to furnish certificate of vaccination upon request of Provincial officer.

9. Every employee in any lumbering camp, mining camp or other industry on which men are employed shall, when requested by the secretary or officer of the Provincial Board of Health, furnish the foreman or other person in charge of the same with a certificate of successful vaccination or re-vaccination within the immediate preceding seven years, and the secretary or officer of the said Board shall forthwith quarantine any such camp or works until such certificate has been furnished by each and every employee in the said camp, works or industry.

Two classes of hospitals must be provided by all employers.

10. In connection with every camp, work or dwelling coming under these regulations, there shall be constructed a building, or in lieu thereof, a double-walled tent or tents shall be kept on hand with floor or floors and with facilities for

heating and ventilation, for the reception of any employee who may become sick. Such building or tent to be approved by the inspector or other officer of the Provincial Board of health. Should any communicable disease, such as smallpox, chickenpox, diphtheria, scarlet fever, typhoid fever, measles, German measles, glanders, cholera, erysipelas, tuberculosis, mumps, anthrax, bubonic plague, rabies, poliomyelitis, cerebro-spinal meningitis and whooping cough, as defined by the Public Health Act, break out, a separate and distinct isolation hospital, building or tent, provided by the owner, shall be located by the physician in charge of the patient in a position satisfactory to the inspector or officer of the Provincial Board of Health.

Site of camp, buildings, etc., to be approved by inspector.

11. The location of the buildings of any camp or works shall be made with a due regard to its healthfulness, and any new camp or works located without the previous approval of the inspector or officer of the Provincial Board must, if the site is found to be undrained, unhealthy, or wanting in any adequate or wholesome water supply, be moved to a proper location; and any old camp, works or dwelling, if proved unsanitary or unhealthy shall be made satisfactory to the aforesaid inspector or officer.

No camp shall be erected nearer than 100 feet to any lake, stream or other water.

All bunks must be constructed parallel with the wall of the building to prevent overcrowding.

The lower tier of bunks shall be raised at least one foot from the floor, and the floor shall extend completely to the wall.

Provisions as to air space, lighting, etc.

12. Any house, tent or dwelling occupied by the employees engaged in any industry in any territory without municipal organization shall contain 600 cubic feet of air space for every occupant thereof, and shall further be provided with sufficient means of ventilation. The floor of every dwelling shall be constructed of boards or planks, or other material equally suitable for the purpose, raised on supports at least one foot from the ground, and so made that it shall be tight. Every such dwelling, other than a temporary tent, not exceeding ten by fifteen feet, shall be supplied with adequate lighting, and in all wooden or iron structures the windows must be constructed that they can be opened when necessary.

Method of ventilation to be approved.

13. The method of ventilation of every dwelling in which a stove or furnace is used, shall be such as will satisfy the inspector or officer of the Provincial Board. The temperature of the room should be maintained at from 60 degrees to 65 degrees Fahr., and a shallow pan supplied with water shall be kept on the stove to supply air moisture.

Wash-house, laundry and bath.

14. Every camp or the works of any industry coming under these regulations shall be equipped with a separate building to be used as a wash-house or laundry, and attached thereto a room, or, if preferred, a separate building or tent equipped

with a stove and tubs for bath purposes in a manner satisfactory to the inspector or officer of the Provincial Board.

Separate kitchen with dining-room to be provided.

15. Every camp or works shall be supplied with a building or tent properly constructed and set apart as a kitchen or cook-house, and having a dining-room or eating-room in connection therewith, with proper conveniences for the cleanliness and comfort of the employees, and must be satisfactory to the inspector or officer of the Provincial Board.

Refuse to be collected and removed in buckets.

16. Proper buckets shall always be kept on hand into which all refuse, whether liquid or solid, can be placed; and the refuse must regularly be removed to a safe distance from the kitchen, and be so deposited as not to create a nuisance or contaminate the drinking water. A properly constructed drainage system satisfactory to the aforesaid inspector or officer may be utilized in lieu of slop buckets.

Latrines or earth closets to be kept clean.

17. Latrines, earth and other closets located to the satisfaction of the physician employed, and to the inspector or officer of the Provincial Board, shall be constructed at every camp or works, and must be located and maintained in a sanitary condition satisfactory to the medical officer of the works and to the aforesaid inspector or officer.

Stables to be not less than 125 feet distant from kitchen, etc.

18. The stables in connection with any works or camp must be so located as not to contaminate the water supply, or drain to any water; they must not be less than 125 feet distant from any dwelling or kitchen. In large camps this distance may be increased if thought necessary by the aforesaid inspector or officer.

In mines of 100 feet in depth, portable privies are required.

19. In mines of a depth of 100 feet or over, or with drifts of 300 feet or over, portable closets satisfactory to the Provincial Board for the use of the employees are required.

Printed copies of Regulations to be forwarded by Board and kept on file in office.

20. Printed copies of these regulations shall be furnished every employer of labour upon notifying the Secretary of the Provincial Board, as required under section 1 of these Regulations, and a copy shall be kept on file in the office of each clerk of the works for the use of the employees if so desired.

Board may enforce regulations at expense of employer.

21. Should the Provincial Board, on complaint or otherwise, find that any of these regulations are not complied with, the Board or its inspector shall, when necessary, take steps to enforce these regulations; and the expense of such inspection

shall be paid by the employer or his agent responsible for the violation of the regulations, as provided under section 117, subsection 3, of the Public Health Act.

Penalties same as under Section 84 of the Public Health Act.

22. The penalties contained in Section 84 of the Public Health Act against illegal carrying on of any industry mentioned therein, shall apply to the violation of any regulation herein made with regard to the proper location, construction and equipment of the camps, works or dwellings under these regulations.

INFORMATION REQUIRED TO BE FURNISHED ANNUALLY TO THE PROVINCIAL BOARD OF HEALTH BY PROPRIETORS OF LUMBER CAMPS AND OTHER CAMPS IN UNORGANIZED DISTRICTS.

1. List of camps and locations of each.
2. Name of foreman in each.
3. Means of access to each camp.
4. Average number of men in each camp.
5. Name and residence of physicians contracted with and whether located in camp or not.
6. Date of contract and its duration.
7. Whether contract is under Clause 2 only, or 2 and 3, under the powers of the Regulations, and if under the latter, state amount deducted from each man's pay monthly for physician's fee.
8. Is a permanent hospital provided in camp, or tent.
9. Hospital tickets sold to employees in the camps are not recognized by this Board in lieu of the requirements of the Regulations.
10. The above information must be furnished immediately on the establishment of every camp.
11. A copy of the medical contract, properly dated and signed by both parties, must be furnished this Board at the time of the making, and also a notification of any change in physicians or terms of contract.

Regulations for the Control of Tuberculosis.

1. Whenever any legally qualified medical practitioner knows that any person whom he is called upon to visit is infected with tuberculosis, he shall within twelve hours give notice thereof in the prescribed form to the Medical Officer of Health of the municipality in which such diseased person is.

2. This section shall apply to the medical superintendent or person in charge of any general or other hospital in which there is known to him to be a patient suffering from tuberculosis.

3. The Medical Officer of Health shall enter in a book to be kept for that purpose, in the prescribed form, the particulars contained in the notice, and shall

further make a weekly report of all the cases so reported to him to the Secretary of the Provincial Board of Health.

4. The Medical Officer of Health in cities, towns and villages shall keep in his office a map of the municipality and shall mark thereon the lot, street or other place where the case of tuberculosis or suspected tuberculosis occurred and shall also make a further distinguishing mark where the death of a patient is reported to him.

5. Immediately on receipt of a notice, the Secretary of the Provincial Board of Health shall, upon request of the Medical Officer of Health, mail to the address of the patient such instructions for the care and prevention of the disease as may from time to time be authorized by the Provincial Board.

6. The Local Board of Health or Medical Officer of Health shall maintain whatever supervision they may deem necessary over the case and, if in their opinion the health of others dwelling in the same house or in personal contact with the patient is threatened, they shall order the removal of the patient to a hospital or sanatorium.

7. Every such patient shall remain in such hospital or sanatorium until in the opinion of the Medical Officer of Health he may safely be allowed to return to his former place of abode.

8. In case of an indigent patient whose removal has been so ordered, the expense of such removal and the cost of maintenance of such patient shall be paid by the municipality where the patient has had his usual place of abode, and if the patient has no permanent place of residence, or his usual place of abode cannot be ascertained, then the cost of his removal and maintenance shall be paid by the municipality whose Medical Officer of Health or Local Board of Health has ordered such removal.

9. In the case of unorganized districts these Regulations shall be enforced and carried out under and by order of the Provincial Board, and the cost of removal and maintenance shall be paid out of the money appropriated therefor by the Legislature.

10. In the case of death, removal or recovery of a person suffering from tuberculosis, it shall be the duty of the Medical Officer of Health to provide that the residence of such patient shall be thoroughly and efficiently disinfected and renovated at the cost of the owner before any person is allowed to occupy such residence.

11. The Medical Officer of Health may, when he deems necessary, require that any premises occupied by a person suffering from tuberculosis shall be cleansed and disinfected to his satisfaction at the expense of the municipality.

12. All information furnished to the Medical Officer of Health or Local Board of Health and the entries made by the Medical Officer of Health, and all subsequent reports furnished with respect to any cases or suspected cases of tuberculosis shall, so far as possible, be treated confidentially, and all persons having official knowledge of the case shall not divulge or permit to be divulged any of the particulars to any person except as authorized by the Regulations.

13. The person affected with tuberculosis, or those in charge of him, shall on removal or change of residence at once report such change of residence to the Medical Officer of Health of the municipality in which such change occurs, and in case such person shall remove from one municipality to another municipality, he shall at once give notice thereof to the Medical Officer of Health of each municipality.

14. Upon the recovery of any person from tuberculosis, the attending physician shall report the fact to the Medical Officer of Health, who shall make record thereof and such person shall thereupon be relieved of further liability under the Regulations.

Quotation from The Public Health Act.

Respecting the Sanitary Precautions to be taken in Health Resorts, Summer Resorts, and upon Boats or other Vessels plying upon the Waters of Ontario, and for preventing the Pollution of such Waters by the deposit therein of sewage, excreta, manure, vegetable, or animal matter or filth:

SECTION **91**.—(1) No garbage, excreta, manure, vegetable or animal matter or filth shall be discharged into or be deposited in any of the lakes, rivers, streams or other waters in Ontario or on the shores or banks thereof.

(2) The owners and officers of boats and other vessels plying upon any such lake, river, stream or other water shall so dispose of the garbage, excreta, manure, vegetable or animal matter or filth upon such boats or vessels as not to create a nuisance or enter or pollute such lake, river, stream or other water.

(3) Residents of a health resort or summer resort shall so dispose of garbage, excreta, manure, vegetable or animal matter or filth as not to create a nuisance or permit of its gaining entrance to or polluting any such lake, river, stream or other water.

(4) Any person who contravenes any of the provisions of this section shall incur a penalty not exceeding $100. (*See* 6 Edw. VII. c. 19, s. 32.)

REGULATIONS OF THE PROVINCIAL BOARD OF HEALTH RESPECTING SEWAGE DISPOSAL IN SUMMER RESORTS.

REGULATION 1. No raw sewage is allowed to enter the lakes, streams or other waters of the Province.

REGULATION 2. The sewage of hotels and boarding houses is laid down at three (3) cubic feet, or twenty (20) gallons, per head. In private houses one-half this quantity will be the average amount.

REGULATION 3. One of the following methods may be used:

(1) DRY EARTH CLOSETS remote from the water, if carefully attended to. Use dry earth, wood or coal ashes.

(2) SUB-SURFACE IRRIGATION—

(*a*) In first-class soil, that is, pure sand, or porous sandy loam, use 40 tile per head, with one flushing in 24 hours.

(*b*) If the irrigation area is 150 feet or more from the water, the number of tile may be reduced to 20 with two flushings in 24 hours.

(*c*) Any variation of (*a*) and (*b*) will depend upon the nature of the soil and the distance from the water to be protected. These questions will be determined by the Provincial Board.

(3) CHLORINATION. Where the soil is unsuitable for sub-surface irrigation the sewage may be treated by:

(*a*) An approved type of sedimentation tank. The effluent from this is to be treated by the use of 15 parts per million of available chlorine, with a rest of three hours maximum flow (one-sixth of the total flow).

(*b*) In cases where sprinkling filters are used in addition to the sedimentation tank, the quantity of chlorine which may be used shall be determined by the Board according to the efficiency of the filter.

REGULATION 4. Every plan of sewage disposal shall, before its establishment, be approved by the Provincial Board of Health.

Regulations for the Control of Inspection of Meat.

1. Where a municipality has established a public slaughter house or abattoir and appointed one or more inspectors in accordance with the Public Health Act, such municipality may pass by-laws requiring that no carcass or meat shall be offered for sale or sold therein unless such carcass or meat has been inspected and stamped with the official stamp of the inspector or of a Dominion or Provincial Inspector.

2. The slaughter house or abattoir shall be constructed, equipped and maintained to the satisfaction of the Provincial Board.

3. Every by-law and the rules, regulations and charges thereunder shall be approved by the Provincial Board.

Regulations Respecting the Matter of Providing Pure Drinking Water in Public Places.

The following regulations are made under paragraph 14 of Section 13 of the Public Health Act (amended 1911).

REGULATION 1.—Hotels, restaurants, railway trains and depots, boats and all other public places which provide a supply of drinking water for the use of the public shall at all times be required to provide that such drinking water shall be pure and wholesome.

REGULATION 2.—Any contravention of the foregoing Regulation shall be subject to the penalties provided by the Public Health Act in respect thereto.

Regulations of the Provincial Board of Health in Respect to Burials and Transportation of the Dead.

1. The body of any one who has died of smallpox, scarlet fever, measles, diphtheria, croup, bubonic plague, cholera, epidemic cerebro-spinal meningitis or epidemic anterior poliomyelitis, shall be interred forthwith except as hereinafter provided, and in no case shall exposure of the body be allowed or a public funeral held.

2. The body of anyone who has died of smallpox, scarlet fever, measles, diphtheria, croup, bubonic plague, cholera, epidemic cerebro-spinal meningitis or epidemic anterior poliomyelitis, shall in no case be transported by railway, boat or other public conveyance unless such body has first been completely wrapped in a sheet wrung out in 1-in-500 bichloride of mercury and enclosed in an hermetically sealed coffin to the satisfaction of the Medical Officer of Health, whose certificate to this effect shall appear upon the outside of the coffin. The coffin must not subsequently be opened.

3. The body of any one who has died of any of the aforesaid diseases shall not be disinterred for any reason except by the order of the Attorney-General, unless for purposes of transportation or reinterment within Ontario, in which case the precautions named in Regulation 2, must be complied with under the supervision and with the consent of the Medical Officer of Health.

4. The body of any one who has died of any other than a communicable disease may be transported or disinterred for interment or re-interment under the certificate of the Medical Officer of Health.

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